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The Pharmaceutical Society of Hong Kong
The Practising Pharmacists Association of Hong Kong
The Society of Hospital Pharmacists of Hong Kong

GlucoCLEAN 殼糖寧

供關注血糖的人士服用

「五層龍」配方

- 是斯里蘭卡國寶，日本人氣天然原料，緩解進食後之憂慮。
- 20年現代醫學臨床療效驗證。臨床證實，**餐時**服用五層龍提取物，或有助於穩定血糖 [1,15]

日本人気

GMP 日本製造
日本GMP認定工廠生產

[1] Phytother. Res. 2015,29: 986-995. [2] J Jpn. Assoc. Dietary Fiber Res. 1999, 3 (1) :13-19. [3] Am J Clin Nutr. 2009, 89:114-125. [4] Eur. J. Nutr., 2007 46(3):133-138. [5] Journal of Health Science, 2009, 55(5): 838-844. [6] Biol. Pharm. Bull. 2003, 26(8) : 1100-1103. [7] Biol. Pharm. Bull. 2010, 33(9): 1511-1516. [8] Asian Pac J Trop Dis. 2013 Apr; 3(2):93-102. [9] J Trace Elem Med Biol. 2011, 25(3):149-53. [10] Nippon Rinsho 1996,54:79-84. [11] J Am Coll Nutr 1997, 16:404-410. [12] Int J Mol Sci. 2010,11: 1365-1402. [13] Chem Pharm Bull (Tokyo). 1998, 46(8):1339-40. [14] Biochemistry. 2010, 49(3):443-51 [15] J Jpn Soc Nutr Food Sci 2000, Vol.53(5)199-205. 此產品沒有根據《藥劑業及毒藥條例》或《中醫藥條例》註冊，為此產品作出的任何聲稱亦沒有為進行該等註冊而接受評核。此產品並不供作診斷、治療或預防任何疾病之用，此產品不能代替藥物，需配合均衡飲食。

五層龍小知識 Salacia Tips

「五層龍」為衛矛科五層龍屬的植物，自古代印度已被阿育吠陀醫學所應用，在斯里蘭卡是承傳千年國寶草藥。「五層龍」於現在日本、美國作為食品補充劑廣泛使用，能抑制碳水化合物分解[13-14]，減少澱粉質轉化[1]，為嗜甜者、肥胖人士帶來喜訊。

五層龍飲食 Salacia Ingredient

日本人在飲食方面相當注重健康，在烹調時已經把五層龍的成份混入食材中，連鎖餐廳更推出「五層龍牛肉飯」，在招牌牛肉飯中加入能夠抑制澱粉質吸收的五層龍(Salacia)，表示比普通版的牛肉飯更健康，令人吃完一整碗牛肉飯，都不怕吸收過多澱粉質。

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INSTRUCTIONS FOR AUTHORS

The Hong Kong Pharmaceutical Journal is a journal of the pharmacists, for the pharmacists and by the pharmacists. Submissions are welcome for the following sections:

- Pharmacy Education & Practice
- Drugs & Therapeutics
- Primary Care
- OTC & Health
- Pharmaceutical Techniques & Technology
- Medication Safety
- Herbal Medicines & Nutraceuticals
- Society Activities
- New Products

Comments on any aspects of the profession are also welcome as Letter to the Editor.

There is no restriction on the length of the articles to be submitted. They can be written in English or Chinese. The Editorial Committee may make editorial changes to the articles but major amendments will be communicated with the authors prior to publishing.

It is preferable to have original articles submitted as an electronic file, in Microsoft Word, typed in Arial 9pt. Files can be sent to the following address:

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For detail instructions for authors, please refer to the first issue of each volume of HKPJ.

Primary Health Care Pharmacy in Hong Kong

Primary health care, according to World Health Organization (WHO), is a "whole-of-society approach to health that aims to ensure the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and preferences (as individuals, families, and communities) as early as possible along the continuum form health promotion and disease prevention to treatment rehabilitation and palliative care, and as close as feasible to people's everyday environment."[1] In another word, primary health care addresses the majority of people's health needs throughout their lifetime by providing care in the community and through the community.

The opening of first District Health Centre (DHC) in Kwai Tsing District has sparked renewed interest in primary health care. As stated by Professor Sophia Chan in Hospital Authority (HA) Convention 2015, primary health care is the first level of care at community level and is ideally positioned to provide on-going care and to support people to control of their health.[2] With adequate education and training in pharmacotherapy and chronic disease management, pharmacists are valuable to primary health care. Moreover, knowledge and experience in diagnosis of minor ailments and wellness services, including patient education and preventative care counseling well-positioned pharmacists to be the one of the providers of primary health care.

This issue of HKPJ, we have three articles under the Primary Care Section. The article written by Wong, Kit-tang and Chung, Chun-kit is a report on the Primary Care Pharmacy Consortium 2019, an event jointly organized by the Department of Pharmacology and Pharmacy, the University of Hong Kong and Pharmacist Connect. During this event, local community-based primary health care providers shared their experiences, visions, opportunities and challenges in providing pharmacy services in the community/primary health care settings. This report summarized the key insights that were discussed/developed in the Consortium as well as the sharing by each speaker. The articles written by Law, Kit Ki and Chan, Sik Yuen both described possible/potential roles of pharmacist in primary health care. Pharmacists can take part in health promotion, as suggested by Law, Kit Ki, through incorporating elements of health coaching into practice and collaborating with patient for behavioral change and lifestyle modification. In addition, Chan, Sik Yuen highlighted the role of pharmacist in the provision of travel health advice. Pharmacists can provide advice pertinent to travel-related diseases such as traveler's diarrhea, altitude sickness, malaria and yellow fever. In addition, pharmacists can work with physicians in recommending required vaccinations and selecting appropriate prophylactic medications.

I hope that you enjoy reading this issue. As always, your suggestions on any part of the Journal is valuable and can send the comments to me or other members of the Editorial Committee.

May PS Lam
Editor-in-Chief
15 October 2019

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Prepared by Howard Chan; Chiu TS Ching

Novel Rimegepant Formulation Superior to Placebo in Acute Treatment of Migraine

Date: July 13, 2019

Rimegepant, a calcitonin gene-related peptide (CGRP) receptor antagonist, established efficacy in providing acute relief for migraine in previous studies. A recent clinical study conducted in the United States suggested that rimegepant orally disintegrating tablets, a novel formulation of the drug, was superior to placebo with respect to both efficacy and safety in acute migraine treatment amongst adults aged 18 or above.

NCT03461757 is a 6-month double-blind, multicenter, placebo-controlled phase 3 trial. 1466 participants whose migraine onset occurred before age 50, having number of moderate or severe migraine episodes per month in between 2 to 8, and experiencing fewer than 15 days of headache per month over the past 3 months, were selected. They were further randomized in 1:1 ratio, stratified by use of prophylactic agents, each group receiving rimegepant orally disintegrating tablets 75mg and placebo respectively. Coprimary endpoints were freedom from pain and the most bothersome symptom 2 hours after administration, while safety was evaluated based on occurrence of adverse events, vital signs, and routine laboratory tests.

With respect to coprimary outcomes, rimegepant was significantly more effective than placebo in both freedom of pain (21% vs 11%, p<0.0001; risk difference, 10, 95% confidence interval [CI], 6-14) as well as the most bothersome symptom (35% vs 27%, p=0.0009; risk difference 8, 95% CI, 3-13). Nausea and urinary tract infection were the most commonly reported adverse events in the rimegepant arm; no serious adverse events were reported in both rimegepant and placebo groups.

Trial results not only suggested the potential of rimegepant in relieiving migraine, it also demonstrated the role of CGRP in migraine development. The trial adopted a single-attack study design, therefore further studies are warranted to investigate its benefits for multiple attacks and long-term safety.

Source: www.thelancet.com

Nifedipine Retard, Labetalol and Methyldopa Proved Safe and Effective as Single Drugs in Treating Severe Hypertension in Pregnancy

Date: August 1, 2019

A study conducted between April 1, 2015 to August 21, 2017 in India suggested that three oral antihypertensives – nifedipine retard, labetalol and methyldopa – were both safe and effective as a single drug in managing severe hypertension in pregnancy.

In this multicenter, parallel-group, open-label randomized controlled trial, 894 pregnant women aged 18 or above, with fetuses reached gestational age of at least 28 weeks and having severe hypertension (defined as systolic blood pressure [SBP] ≥160mmHg or diastolic blood pressure [DBP] ≥110mmHg), were recruited and randomized in 1:1:1 ratio. Participants received an initial dose of 10mg oral nifedipine, 200mg oral labetalol or 1000mg oral methyldopa, with the former two allowing dose escalation once if systolic or diastolic blood pressure of participants exceeded 155 and 105 respectively. The primary outcome was blood pressure control (SBP 120 to150mmHg, DBP 70 to 100mmHg) within 6 hours in the absence of adverse events.

Targeted blood pressure control was significantly more common in the nifedipine group than those in the methyldopa group (249 [84%] vs 230 [76%]; p=0.03), but no significant difference was observed between nifedipine and labetalol groups (249 [84%] vs 228 [77%], p=0.05). While incidence of neonatal morbidities was similar between groups, neonatal admission to intensive care units was significantly higher in infants born to women who received nifedipine compared to labetalol (p=0.009) and methyldopa (p=0.004), mostly due to low birthweight.

Results of this clinical trial indicated that oral antihypertensives possess the potential to be further utilized in managing severe hypertension in pregnancy, compared to intravenous medications such as hydralazine, which require close fetal monitoring and invasive route of administration.

Source: www.thelancet.com

FDA Approves New Add-on Drug to Treating "Off" Episodes in Adults with Parkinson's Disease

Date: August 27, 2019

The US FDA approved Nourianz (istradefylline) tablets as an add-on treatment to levodopa/carbidopa in adult patients with Parkinson's disease (PD) experiencing "off" episodes. An "off" episode is a time when a patient's medications are not working

well, causing an increase in PD symptoms, such as tremor and difficulty in walking.

The effectiveness of Nourianz in treating "off" episodes in patients with PD who are already being treated with levodopa/carbidopa was shown in four 12-week placebo-controlled clinical studies that included a total of 1,143 participants. In all four studies, patients treated with Nourianz experienced a statistically significant decrease from baseline in daily "off" time compared to patients receiving a placebo.

The most common adverse reactions observed in patients taking Nourianz were dyskinesia, dizziness, constipation, nausea, hallucination and insomnia. Patients should be monitored for development of dyskinesia or exacerbation of existing dyskinesia. If hallucinations, psychotic behavior, or impulsive/compulsive behavior occurs, a dosage reduction or discontinuation of Nourianz should be considered. Use of Nourianz during pregnancy is not recommended; women of childbearing potential should be advised to adopt contraceptive measures during treatment.

Source: www.fda.gov

The ENTRUST-AF PCI Trial: Edoxaban-based versus Vitamin K Antagonist-based Antithrombic Regimen After Successful Coronary Stenting in Patients with Atrial Fibrillation

Date: September 3, 2019

Currently, dual antiplatelet therapy (DAPT) with aspirin and P_2Y_{12} antagonist is recommended after PCI and patients requiring DAPT often also require oral anticoagulants, including those with atrial fibrillation (AF), but such triple therapy is associated with high bleeding risk. Edoxaban is as effective as a vitamin K antagonist (VKA) with respect to the prevention of stroke or systemic embolism and is associated with a significantly lower incidence of bleeding and death from cardiovascular causes. However, the effects of edoxaban in combination with a P_2Y_{12} inhibitor in the setting of PCI are unexplored.

ENTRUST-AF PCI is a randomized, multicenter, open-label, non-inferiority trial. Patients had AF requiring oral anticoagulants, were aged at least 18 years, and had a successful PCI for stable coronary artery disease or acute coronary syndrome. Participants were randomly assigned (1:1) from 4 hours to 5 days after PCI to receive either edoxaban (60 mg daily) plus a P_2Y_{12} inhibitor for 12 months, or a VKA plus a P_2Y_{12} inhibitor and aspirin (100 mg once daily, for 1 to 12 months). Edoxaban dose was reduced to 30 mg per day if one or more factors (CrCl 15 to 50 mL/min, bodyweight ≤60kg, or concomitant use of specified potent P-glycoprotein inhibitors) were present. The primary endpoint was a composite of major or clinically relevant non-major (CRNM) bleeding within 12 months.

1506 patients were enrolled in the ENTRUST-AF PCI trial and randomly assigned to the edoxaban (n = 751) or VKA regimen (n = 755). Median time from PCI to randomization was 45.1 hours (Interquartile range, 22.2 to 76.2). Major or CRNM bleeding events occurred in 128 (17%) of 751 patients (annualized event rate, 20.7%) with the edoxaban regimen and 152 (20%) of 755 patients (annualized event rate, 25.6%) patients with the VKA regimen (hazard ratio, 0.83; 95% CI, 0.65 to 1.05; p=0.0010 for non-inferiority).

In patients with AF who had PCI, edoxaban-based regimen was non-inferior to VKA-based regimen for bleeding risk, and without significant differences in ischemic events.

Source: www.thelancet.com

First District Health Centre officially opens in Hong Kong

Date: September 24, 2019

The Chief Executive, Mrs Carrie Lam, officially opened the Kwai Tsing District Health Centre (DHC), the first DHC in Hong Kong on 24 September 2019.

Speaking at the opening ceremony, Mrs Lam said to ensure the long-term and sustainable development of the public healthcare system and to protect public health, the Government has stressed that it is important to promote primary healthcare. The commissioning of the DHC is a step forward in changing Hong Kong's public healthcare system. Kwai Tsing is the first among the 18 districts and it is planned to introduce primary healthcare services of different scales in the remaining 17 districts before the end of the current-term Government in June 2022.

The Secretary for Food and Health, Professor Sophia Chan, said that the DHC is a key component of the primary healthcare system. Through its NGO operator and a private service network in the community, DHC services will focus on primary, secondary and tertiary prevention. The DHC will offer people-oriented primary healthcare services to residents in the district, regardless of their age and health condition. The DHC would become a district primary healthcare hub comprising a core centre serving as the headquarters, supplemented by sub-district satellite centres and a network of multi-disciplinary teams providing multiple access and service points. The DHC would co-ordinate with community partners providing social welfare and healthcare services in the district, and make referrals as necessary.

Source: https://www.fhb.gov.hk/en/press_and_publications/press/2019.html

Emerging of the Cosmeceutical Market and the Plan for Stringent Regulations in Hong Kong by Referencing Other Countries

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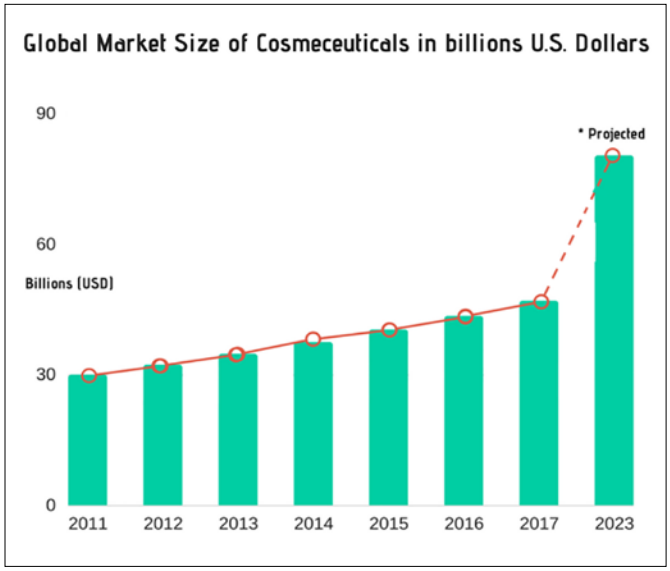
ABSTRACT

Nowadays consumers look for stronger, faster and better skin products, that is why cosmeceuticals have gained popularity in the cosmetic market, as it brings bioactive ingredients or guarantees therapeutic effects. However, these products require more stringent regulation than the usual cosmetic products; otherwise, it can pose more harm than benefits to the public. Therefore, we suggest the regulatory body should first clearly define cosmeceuticals, according to their contents and claims. Targeting these products, more stringent requirements should be posted on contents, labeling and manufacturing of these products in Hong Kong, by taking references from other countries. Pharmacists, as experts in manufacturing and regulations, have the responsibility and qualifications in pushing the regulation, for the sake of public health and consumers' benefits.

Keywords: *cosmeceutical, cosmetic, pharmaceuticals, regulations*

RAPID GROWING MARKET

Cosmeceutical is a new marketing buzz word, differentiating a category of cosmetics that are believed to be superior to the traditional cosmetics. The superiority stems from the presence of active ingredients that have been shown to improve skin cells' functions, for instance, antiaging, antioxidant. The growth of this category is expanding at a 7.77% annual rate from 2011 to 2017, its global market size grew from USD 30 billion USD to 47 billion[(1)], and it is expected to reach USD 80.36 billion by 2023 **(Graph 1)**.[(2)]

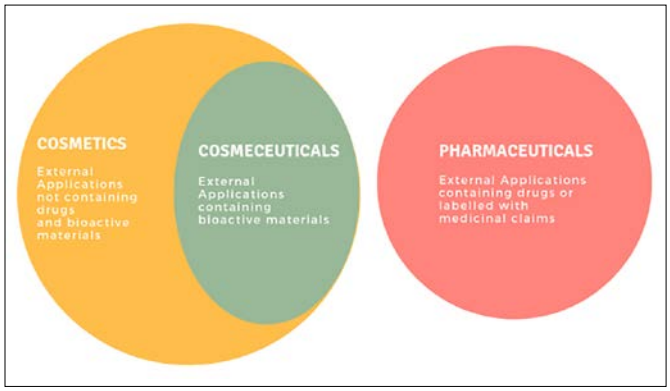


Graph 1. *Bar chart to show the growing trend of cosmeceutical global market. The rate of growth is increasing every year, and the projection of 2023 is estimated to be a double of 2015's size.*

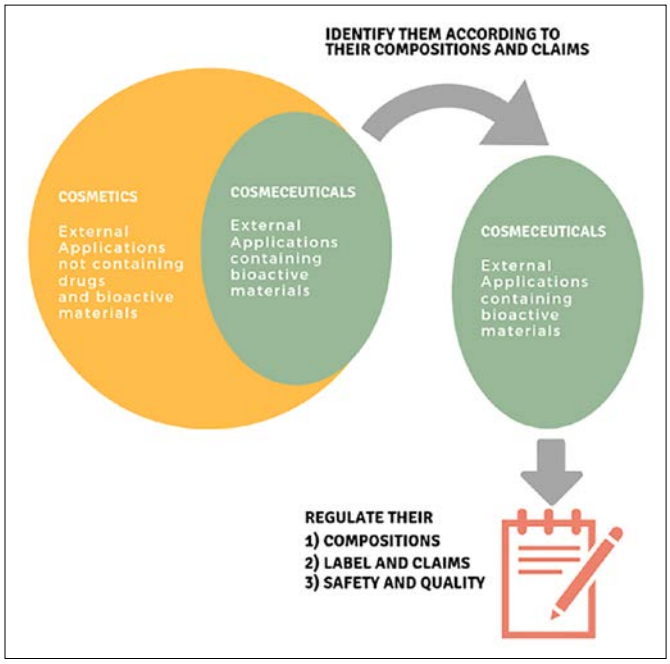
LACK OF DEFINITION AROUND THE WORLD

There is a lack of an official definition for cosmeceuticals, by any health authority in the world. Most of the health authorities only define cosmetics and drugs, but not the interim, cosmeceuticals.[(1)] For example, FDA has asserted that cosmeceuticals are not carrying any legal meaning.[(3)] In **graph 2**, it has illustrated the differences between cosmetics, cosmeceuticals and pharmaceuticals.

Products that contain 1) any drug substances, and 2) any medicinal labels are classified as pharmaceuticals (pink); otherwise they are either cosmetics or cosmeceuticals. Products containing bioactive materials that can affect skin cell's functions are cosmeceuticals (green), otherwise, cosmetics (yellow).



Graph 2. *Schematic illustration of the difference between cosmetic, cosmeceutical and pharmaceutical external applications.*



Graph 3. *Illustration describing the proposed pathway of regulation on skin products for Hong Kong in the future.*

REGULATION-FREE ENVIRONMENT OF COSMETICS IN HONG KONG

It is not uncommon for the Hong Kong health authority (i.e. Department of Health) to follow other major health authorities; thus, there is not an official definition for cosmeceuticals as well. Unlike other countries, there is no registration requirement, even for drug-free skin products, and any definition of cosmetics. The general consensus in Hong Kong is that any non-pharmaceutical skin products would fall into the category of cosmetics. These products are regulated, though not stringently, by the Consumer Goods Safety Ordinance (Cap 456) (CGSO)[4] and its subsidiary legislation, Consumer Goods Safety Regulation (Cap 456A).[5] They require the manufacturers to comply with "the general safety of the goods", without any more concrete suggestion.

Several reports, as summarized in **table 1**, published by the Consumer Council, have manifested that many skin products, including the named brands, contain allergenic ingredients, that can be harmful to both normal and sensitive skins.

Table 1. Summary of News Titles Related to Problematic Cosmetic Product.

Date	News Title
16/07/2018	14款抗橙皮紋乳霜功效微乎其微消費者選購前宜三思
16/10/2017	【消委會】$160潤唇膏保濕程度同$39一樣9樣本含可致敏香料
15/08/2017	44款洗頭水驗出二噁烷、可致敏防腐劑或甲醛
18/04/2017	40款保濕面膜圖文逐點比併SK-II、LANCOME含致敏物甲脂 Olay含鉛及致敏物乙酯、丙酯
15/02/2017	消委會：57潤膚乳含致敏成分7款釋甲醛
05/11/2016	【消委會報告】17款保濕日霜測試最平最貴效果一樣
14/07/2016	60款沐浴產品逾半含二噁烷27款檢出可致敏防腐劑
20/10/2014	消委會報告！平價面霜更勝貴價品牌
15/08/2009	消委會報告漂牙產品或影響胎兒安全

Apart from the ingredients, the claims are not regulated at all. Reports from the Consumer Council criticized skin products claiming to be infant-safe, actually contained urea, which is an allergen that is particularly harmful to the sensitive skins of babies.[6] Other benefit claims are also exaggerated; the Consumer Council tested 14 different brands of cellulite removal cream, and the reports stated that none of them showed significant efficacy in removing cellulite.[7]

The current mechanism to maintain the quality of the products relies heavily on the consumers: if there is any safety or quality concern regarding the products, consumers have to complain to the Customs, the traders will be prosecuted and fined if convicted. The fine is deemed to lack any retributive effect, as the amount is negligible compared to the profits.[8]

If the consumer requires compensation in cases where safety is not severely compromised, the Consumer Council is available for conciliating the disputes between customers and merchant, yet, without any prosecution power. Hence, further civil proceedings may be required by the complainant when conciliations come to failure.[9]

The regular reports from Consumer Council survey the marketed products, to test their quality and safety, setting up a good reference for the public to avoid problematic goods. However, these reports do not have any legal binding power, failing to push the manufacturers to carry out remediation.[9] Not only harmful chemicals were found, but also the effects of some products do not live up to their claims.

IMPORTANCE OF REGULATING COSMECEUTICALS

It might be less worrying for the traditional cosmetics, for instance, mascara, to be free of stringent regulation, as they are simply external coverage on the skin that has fewer effects on the human skin cells. Cosmeceuticals, however, are not as simple: the claimed bioactive ingredients' functions and concentration could be questionable; the beneficial bioactive ingredients could pose harm, at a certain concentration or to some groups of consumers, for example, patients with sensitive skin.[10] Some notable examples are whitening products and epilating agents. Apart from that, cosmeceutical products are generally more expensive, as they usually promise premium ingredients, manufactured in a more advanced technology.[11] Therefore, it is critical to ensure the products can deliver the claimed effects.

TAKING SMALL STEPS

It is foreseeable that the government will receive a huge backlash from the industry, if a universal regulation on all cosmetics is implemented, for two reasons: one, it is very difficult for the cosmetic companies to adapt to the new regulatory environment. It would mean a company needs to set up a regulatory department, and that is a considerable cost. Two, the current international requirement for cosmetics, are not in consensus, it is hard to convince the industry to follow a rigid regulation all at once. For instance, the European Union (EU) requires all cosmetics to be registered before being sold,[12] but in the United States (US), cosmetics registration is voluntary.[13] Therefore, for the sake of a healthy and feasible regulatory system, taking smaller steps is much preferred.

IDENTIFY COSMECEUTICALS FROM COSMETICS

Instead of controlling all skin products, we can start with cosmeceuticals. There is a critical need for better and more stringent control for cosmeceuticals, to safeguard consumers' safety, and protect consumers' rights to receive the equivalent benefits from spending on these products.

A skin product first needs to be categorized as pharmaceutical, cosmetic or cosmeceuticals, in order to decide the set of regulation that is applicable. This can be done according to their components and claims. For any products that contain drugs or labelled with medicinal claims, they are under the control of Pharmacy and Poisons Ordinance (Cap 138),[14] the Chinese Medicine Ordinance (Cap 549)[15] and the Undesirable Medical Advertisement Ordinance (Cap 231).[16]

Currently there is no separation between cosmetics and cosmeceuticals in Hong Kong, which should be made for previously mentioned reasons. To differentiate them, we can start with their components and claims. We can create a list of ingredients and cosmeceutical claims, that regulates any non-pharmaceutical products, which either contain any of the listed components, or are labelled with any cosmeceutical claims, to be registered as a cosmeceutical before entering the market.

This list of cosmeceutical components and claims can be made by referencing the practice of countries with well-established policies on skin products.

Cosmeceutical Components

Australia

Cosmetics are regulated by the National Industrial Chemicals Notification and Assessment Scheme (NICNAS)' s notification system.

Australia has established the Australian Inventory of Chemical Substances (AICS), stating all the chemicals available for industrial use in Australia, and their conditions when being used, also the secondary notification requirement, which entails the conditions where the company is responsible to notify the NICNAS.[17]

Simply speaking, if the product's components are registered in the AICS and the company plans to use them in their current conditions of use, there is no need to notify NICNAS. Alternatively, if:

1. The components are not all naturally occurring; or
2. The product's component is introducing a new chemical that is not in AICS; or
3. The components are all registered in NICNAS, but the intended use is new; or
4. Stated specifically in the secondary notification;

then the company has the obligation to notify the NICNAS.

What Hong Kong can learn

Hong Kong ought to make reference to the AICS database, to establish a list of cosmeceuticals that are prone to pose risks on consumers' skins, requiring manufacturers to register with the officials before entering the market. This stringent regulation system is established for monitoring the components in cosmeceuticals. For example, hydroquinone, a compound that is linked with skin darkening, loss of pigmentation and possible

carcinogenicity that have resulted in it being banned from over-the-counter products in some countries,[18] is stated as notification-required in the AICS.

Cosmeceutical Claims

Korea

Korea has established a new category of cosmetics called functional cosmetics, separating from the general cosmetics. The Ministry of Food and Drug Safety (MFDS) imposes more stringent regulation on these products to ensure these cosmetics can demonstrate efficacy and safety. Functional cosmetics include:

1. Products aiding in the whitening of the skin;
2. Products aiding in improving wrinkles in the skin;
3. Products aiding in tanning skin gently or protecting skin from ultraviolet rays;
4. Products aiding in changing or removing the colour of hair, or nourishing hair;
5. Products aiding in preventing or improving dryness, split, loss, cornification, etc. resulting from weakened functions of skin or hair.

What Hong Kong can learn

Hong Kong can set up a list of cosmeceutical claims, that are able to be verified and substantiated with ample evidence, by referring to the idea of functional cosmetics in Korea. Manufacturers could be requested to provide proof upon registering the products with cosmeceutical claims, in order to ensure the efficacy of these products and the rights and interests of consumers.

REGULATION OF COSMECEUTICALS

Identifying the cosmeceuticals from cosmetic products is only the first step. The second step would be regulating these identified products' registration and composition, labeling and claims, and manufacturing standard and safety of final products.

Australia, the United States and Europe are terrific examples of countries with elaborate regulations on cosmetic products. They can serve as some guidance for Hong Kong to follow, on regulating cosmeceutical products. A summary table **(Table 2)** of Australia, United States and Europe' regulations on cosmetics in three different aspects is here.

THE PROSPECTIVE REGULATORY DEVELOPMENT IN HONG KONG

The cosmetic category is well established in the majority of the developed countries, while the cosmeceutical category is rather new to these regulatory bodies. However, it is undeniable that there is a rapid growth of this category and therefore, a proactive step should be taken to ensure the cosmeceutical products are properly regulated and allow effective communication on cosmeceutical products. Hence, Hong Kong's regulatory authority should consider establishing legislation regarding to the marketing claims, ingredients and quality standard of cosmeceutical products.

Regulatory Development for synthetic cosmeceutical products

For the safe and effective use of cosmeceutical products by the general public, it is of paramount importance to ensure the safety and quality of ingredients, the adequacy of information provided to the consumers and the accuracy of the product claims. An up-to-standard manufacturing process should be adopted for the safety and quality of ingredients and a labeling requirement should take place for adequate and correct consumer information.

For the manufacturing standards, the European guideline would be a good example to take reference from. Similar to the PIC/S GMP requirement for pharmaceutical products, the requirements for the manufacturing of cosmetic products have been listed in the official Good Manufacturing Practice documents for the traders. In addition to the manufacturing standard, the quality and safety of the final product have to be assessed in terms of clinical impact, physicochemical stability and microbial quality.

For the restriction of ingredients, the Australian guideline would be another good reference for Hong Kong. The list of permitted chemicals in a cosmeceutical product can be drafted based on the concept of AICS, which has listed all the permitted chemicals in Australia. For ingredients that are not in the list, traders are responsible to notify the Department of Health and submit related documents to support its safety and efficacy, before importing the cosmeceutical products.

For the labeling requirement, it could be divided into two parts, including the essential product information listed on the outer packaging as well as the marketing claims. For the labeling of the outer packaging, Hong Kong may refer to the guidelines enforced in Europe and U.S, which include the name of products, intended use, warning statements, ingredients, expiry dates, manufacturers' and importers' name. Also, warning statements should be mandatory for certain specific ingredients, especially for allergenic substances. For the

Table 2. Comparison of Regulations on Cosmeceuticals in Australia, US and Europe

	Product Registration/ Restriction on Composition	Label/ Claims	Quality and Safety
Australia	• Registration is optional for products if all the components are listed in the Australian Inventory of Chemical Substances (AICS).[19] • Need to notify Australian Department of Health if there is new chemical.[20] • All manufacturers and traders must be registered with the Australian Department of Health.[20]	• All cosmetic products must be labeled with an ingredient list, including color additives on its outer packaging.[20] • No therapeutic or medical claims on cosmetic products' labels or advertisements.[21] • All marketing claims on efficacy must be supported by clinical evidence.[21] • For anti-bacterial skin products, anti-dandruff products, dental care products, anti-acne products and sunscreen products, performance tests must be carried out to prove its efficacy.[21]	• There is no specific code to govern the manufacturing standards of cosmeceutical products and their safety.
USA	• For cosmeceutical product solely registered as a cosmetic product, the company may register through FDA's Voluntary Cosmetic Registration Program but not compulsory.[13]	• All claims must be genuine and evidence-based.[22] • The packaging of the cosmeceutical products has to include the name of products, intended use, warning statements, ingredients, expiry dates, manufacturers' and importers' name and address.[22]	• Manufacturers are obligated to ensure the product safety before marketing, including the quality of the final products and toxicological properties of each constituent.[23]
Europe	• Manufacturers or distributors of the product should notify the European Commission of the product category, contact details of the manufacturers or traders, country of origin, marketing countries formulation and packaging.[24] • Any addition of pharmaceutical substances into the formulation is prohibited.[26] • For ingredients that may pose potential harm to users in high concentration, the use of them in cosmeceutical products is restricted to a certain level of concentration.[25] • For colorants, preservatives and UV filters to be incorporated into the formulation, these substances must be within the list of allowed additives used in cosmetics.[27]	• The packaging of the cosmeceutical products includes the name of products, intended use, warning statements, ingredients, expiry dates, manufacturers' and importers' name and address.[26] • Product labeling and claims are considered as part of the assessment criteria for the cosmetic product safety. Besides the basic labeling requirement of the product particulars, the product claims are also regulated. All the claimed effects of a cosmetic product must be substantiated with scientific evidence.[27] • Warning statements regarding the potential risk of the product should be clearly addressed.[27]	• Products must meet the standards listed in the official Good Manufacturing Practice documents.[27] • Need to assess the clinical impact, the nature of ingredients and impurities, systemic exposure of ingredients, side effect and toxicological profile of the ingredients.[27] • Physicochemical stability and microbial quality, stability data and microbial count within the claimed shelf-life have to be submitted to the authority before sales.[27]

marketing claims, in addition to the trade description for ensuring responsible claims from traders, it is suggested to set a separate regulation, referencing the Europe Parliament regulation for instance, for the cosmeceutical products which contain non-pharmaceutical ingredients, or pharmaceutical ingredients at a limited level, in order to allow evidence-based medicinal claims for qualified cosmeceutical products. Furthermore, setting up a law enforcement agency with the power of prosecution to scrutinize the advertisement before launch could also be effective to ensure safety.

Regulatory Development for herbal cosmeceutical products

For herbal cosmeceutical products, they are relatively more complicated because it is not uncommon for herbs to provide a portfolio of ingredients, in which some may include western pharmaceutical components. Therefore, additional requirements may be needed apart from the proposed regulatory requirements listed for synthetic herbal cosmeceutical products.

According to the current legislation, if the herbal product consists of Chinese medicines as active ingredients, it is covered under the scope of the Chinese Medicine Ordinance[15] It is also regulated by the Consumer Goods Safety Ordinance.[4] However, the Consumer Goods Safety Ordinance only requires the traders to ensure the general quality and safety of the products, without specific restrictions on the ingredients used.[4] To fill this regulatory loophole, there is a need to set up a system to regulate the herbal cosmeceutical products. The government can consider regulating the herbal cosmeceutical products under the Chinese Medicine Ordinance or the PPO. Detailed and sufficient guidance should be given to the traders before the official implementation of new legislation.

THE ROLE OF PHARMACISTS IN CONSTRUCTING A HEALTHY REGULATORY ENVIRONMENT FOR COSMECEUTICAL PRODUCTS

Training from the pharmacy program equips pharmacists with knowledge of pharmaceutical, current pharmacy laws and regulations. The strong knowledge foundation enables pharmacists to understand the regulatory dilemma faced by cosmeceutical products as well as the needs of regulations. Such pharmaceutical expertise background enables them to set up suitable regulations and requirements for cosmeceutical products, including manufacturing standard, restriction of ingredients and labeling requirement. The establishment of the regulations and requirement echoes with the role and responsibility of pharmacists, which is to ensure the correct use of drugs and related products. Pharmacists working in different sectors, especially in industry or health authority, can contribute in different ways, according to their expertise in the field.

Contribution as an industrial pharmacists

While industrial pharmacists in both multinational corporations (MNCs) and local manufacturers work closely with the manufacturing process, labeling and the research and development (R&D), they could also contribute to the regulatory excellence from the commercial and regulatory perspectives.

Working in the commercial team

For pharmacists who work in the commercial team, their main duty would be on the marketing strategy development, product claims development and packaging design. However, in regard to the cosmeceutical category development, there is an extra role for them; the commercial team has frequent contacts with consumers through consumer researches and other commercial incidences. Hence, they understand the consumers' need. Along with their drug knowledge, they can facilitate the R&D team to identify opportunities in the market and help create new products that cater to consumers' therapeutic and dermatological needs.

Contribution in regulatory intelligence

Industrial pharmacists are extremely significant in regulatory affairs. They are specialized in the regulatory requirements for drugs and consumer products, and it is their main responsibility to communicate with the health authorities on a regular basis to ensure the regulatory compliance of their commercial activities. Their good understanding of the government regulatory framework can help balance the safety and commercial benefits of the cosmeceutical category.

Contribution from pharmacists working in regulatory authorities

Optimizing the regulatory control on cosmetic products is the mainstream opinion, as manifested by a survey conducted by the Consumer Council, showing over 90% of consumers support legislation to govern "beauty products".[28] Responding to that, Department of Health can take the initiative to prepare the legislation by referring to related legislation among different countries and discussing with different stakeholders, including the representatives from pharmaceutical industry, cosmetic industry, traders and end users.

Contribution from professional pharmacists' organizations

Apart from individuals working in the industry and government setting, the professional bodies in the pharmacy field serve as a suitable platform for pharmacists from different sectors to exchange their ideas on the issue. The collaboration can exert a greater influence on the development of cosmeceutical products. In addition, the professional bodies in the field can collaborate with each other, their various background provides insights to fill the regulatory loophole.

CONCLUSION

Despite its novelty in the market, cosmeceutical products are evolving and show promising potential in both cosmetic and therapeutic area. However, the lack of legislative supervision has contributed to the public health concern about their safety and efficacy, as well as limited proper communication between traders and the general public. The regulatory requirements from other regions, such as Australia, US and Europe, have provided us with a blueprint in terms of manufacturing standards, restriction of ingredients and labeling requirement. Blindly following their regulations, yet, is never ideal. As healthcare professionals, pharmacists from different sectors have the obligation to work together to push the legislation of cosmeceutical products, according to the existing regulatory environment and regulations in Hong Kong, to safeguard the public health in Hong Kong.

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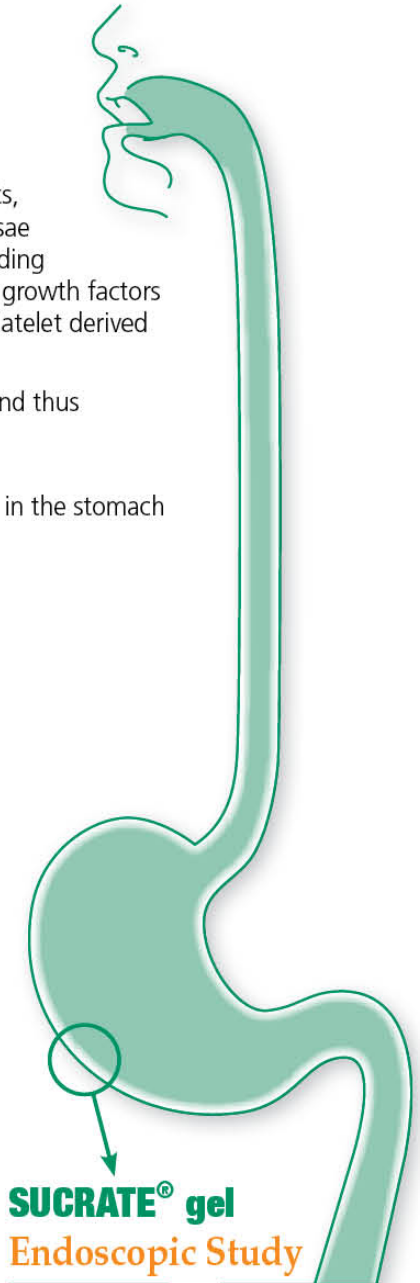

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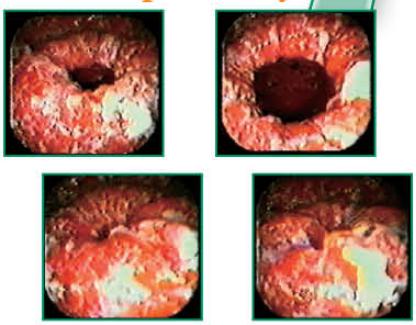

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Spinal Muscular Atrophy: A Treatment Update

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ABSTRACT

Spinal muscular atrophy (SMA) is a rare genetic disease, characterized by progressive muscle hypotonia and atrophy. Conservative treatment has been the mainstay of therapy due to the lack of an effective disease modifying treatment. Nusinersen and onasemnogene abeparvovec-xioi are newly emerged treatment options which bring hope to SMA patients and their family. Nusinersen, a modified antisense oligonucleotide, is the first ever approved therapy for SMA. It has been shown to improve patient's motor milestones achieved. Onasemnogene abeparvovec-xioi is a gene therapy newly approved, in which the safety and efficacy is demonstrated in an ongoing trial and a completed phase 1 trial. The long term safety and efficacy of these new treatment options are yet to be determined.

Keywords: *Spinal muscular therapy, nusinersen, onasemnogene abeparvovec-xioi, gene therapy*

INTRODUCTION

Spinal Muscular Atrophy (SMA) is a rare genetic disease with an estimated incidence of 1 in 6000 to 1 in 10000 live births.[1] It is characterized by progressive muscle hypotonia and atrophy caused by degeneration of the anterior horn cells in the spinal cord and motor nuclei in the lower brainstem.[2] Historically, patients with SMA are largely managed by conservative treatments only, as there is no disease modifying treatment for this disease. However, with recent technological breakthroughs, treatments are now available, with hopes to improve patients' survival, motor function and quality of life. This article would provide an update on the two newly emerged treatment options, nusinersen and onasemnogene abeparvovec-xioi.

PATHOPHYSIOLOGY OF SMA

SMA is caused by mutations in chromosome 5q13 that lead to survival motor neuron (SMN) protein deficiency. In individuals with SMA, a mutated or deleted survival motor neuron-1 (SMN1) gene does not produce enough SMN protein to maintain the survival of motor neurons.[3-5] These neurons control muscle activity by sending signals from the central nervous system (CNS). Without a proper level of SMN protein, motor neurons in the spinal cord will be lost, preventing the body's muscles from receiving signals from the brain. The disease severity varies for patients with SMA. Severity of the disease depends on the SMN protein activity, which in turn is related to a modifying gene, called SMN2.[2] Being 99% identical with the SMN1 gene, there is a C to T transition in exon 7 in the SMN2 gene.[2] As a result, majority of the mRNAs derived from SMN2 produces truncated, non-functional SMN proteins.[2] However, 10 to 15% of the SMN2-derived mRNAs contain exon 7, hence can produce some full length, functional SMN proteins.[2] For SMA patients, this partially compensates for the loss of SMN1 protein. The number of copies of SMN2 gene varies among the population.[2] This explains at least some of the phenotypic variability in SMA patients. The presence of at least 3 copies of SMN2 genes is associated with a milder phenotype.[2]

About 50% of patients with spinal muscular atrophy are born with the severe form, infantile-onset type I, developing profound limb and trunk weakness before 6 months of age, and failing to achieve independent sitting.[1] There is a high disease burden with substantial morbidity and mortality from dysphagia, failure to thrive, hypoventilation, poor airway clearance due to weak cough, and lower respiratory tract infections.[5] The classification for SMA is based on the age at symptom onset and the most advanced motor milestone attained during development.[6]

Table 1. Classification of SMA based on symptom onset and motor milestone[6]

Type	Onset	Function	Median survival
0	Prenatal	Respiratory failure at birth	Weeks
1	0 – 6 months	Never sit	<1 year
2	<18 months	Sit	>25 years
3	>18 months	Stand or ambulatory	Adult
4	30 years	Ambulatory	Adult

TREATMENT

NUSINERSEN (Spinraza®)

Nusinersen is a modified antisense oligonucleotide, where the 2'-hydroxy groups of the ribofuranosyl rings are replaced with 2'-O-2-methoxyethyl groups and the phosphate linkages are replaced with phosphorothioate linkages.[7] Nusinersen binds to a specific sequence in the intron downstream of exon 7 of the SMN2 transcript. Using in vitro assays and studies in transgenic animal models of SMA, nusinersen was shown to increase exon 7 inclusion in SMN2 messenger ribonucleic acid (mRNA) transcripts and production of full-length stable SMN protein.[3-5] It is approved for the treatment of SMA in pediatric and adult patients.[7] The recommended dosage is at a fixed dose of 12mg, given intrathecally.[7] The first three doses should be administered at 14 days intervals, the 4th dose 30 days after, and the maintenance should then be given every 4 months thereafter.[7]

The efficacy and safety of nusinersen for infantile-onset SMA and late-onset SMA were demonstrated in the ENDEAR study and CHERISH study respectively.

Efficacy and Safety of Nusinersen in Infants with Spinal Muscular Atrophy (SMA): the ENDEAR Trial

ENDEAR was a randomized, double-blind, sham-procedure controlled Phase 3 clinical trial with 2:1 randomization, focusing on infants with SMA who were 7 months of age or younger.[8] Two-thirds of individuals received nusinersen and one-third was sham-control. The study had 2 primary end-points, the first one was the proportion of "responders," or individuals with an improvement in motor milestones, as measured by Section 2 of the Hammersmith Infant Neurological Examination (HINE).[8] The second primary efficacy end-point was event-free survival or the use of permanent assisted ventilation.[8] Clinically meaningful benefits were seen in the planned interim analysis when 80 infants had completed at least 6 months (183 days) of treatment.[8] The final analysis showed even greater milestone improvements in a larger group of infants who had completed at least 9 months of treatment.[8] Based on these positive results, researchers stopped the ENDEAR study and transferred participants into an open-label extension study called SHINE, to evaluate the long-term safety or tolerability of nusinersen, in which all patients receive nusinersen.

At the end of the study, there was a significantly greater proportion of nusinersen-treated motor milestone responders versus sham-control responders (51% vs 0%, P < 0.001), demonstrating continued improvement over the previous interim analysis (41% vs 0%).[8] In the nusinersen group, 22% of infants developed full head control, 10% of the infants developed the ability to independently roll from supine to prone positions, 8% developed independent sitting, with half of those being able to sit and pivot, and one infant was able to stand with minimal to moderate support.[8] No infants achieved these milestones in the control group. The risk of death or permanent ventilation was 47% lower in nusinersen group (hazard ratio 0.53, P=0.005). The overall survival was higher in the nusinersen group than in the control group (hazard ratio 0.37; P=0.004). **(Figure 2, 3)** Improvement in the Children's Hospital of Philadelphia Infant Test of Neuromuscular Disorders (CHOP INTEND) (defined as ≥ 4 point improvement from baseline) was significantly greater in nusinersen group (71% Vs. 3%, p<0.0001).[8]

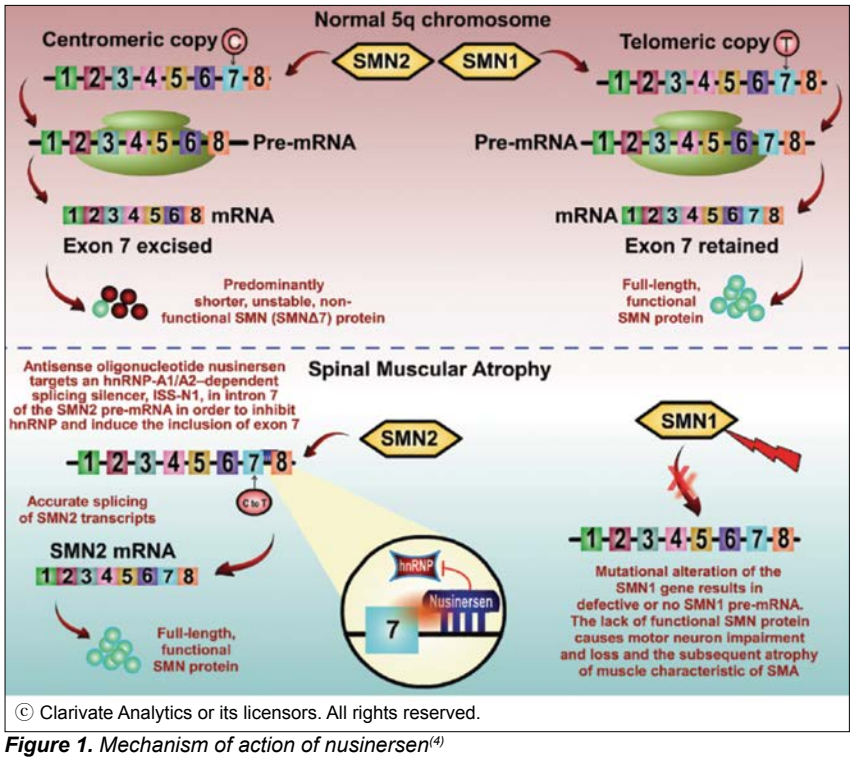

Figure 1. *Mechanism of action of nusinersen[4]*

The overall incidence of adverse events was similar in the nusinersen group and the control group (96% and 98%, respectively).[8] A lower percentage of infants in the nusinersen group than in the control group had a severe adverse event (56% vs. 80%), a serious adverse event (76% vs. 95%), or an adverse event with fatal outcome (16% vs. 39%).[8] The study showed that nusinersen had an acceptable safety profile with respiratory events and constipation being the most commonly reported adverse events.

Efficacy and Safety of Nusinersen in Children with Later-Onset Spinal Muscular Atrophy (SMA): the CHERISH Trial

CHERISH is a randomized (with 2:1 randomization, two-thirds of individuals received nusinersen and one-third

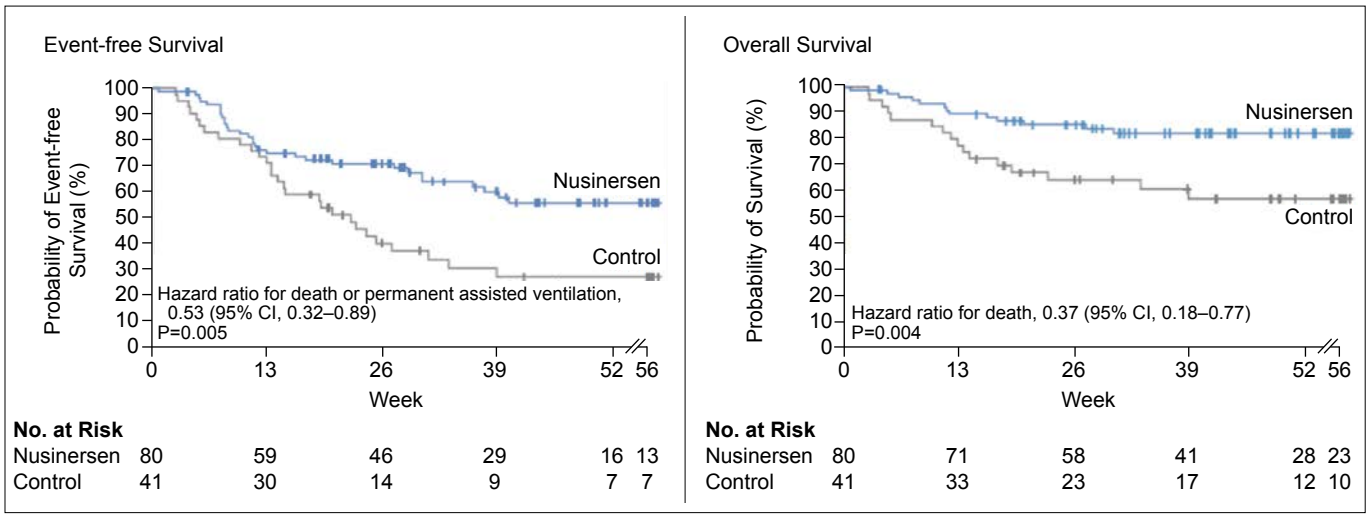

Figure 2, 3. *Event-free survival & Overall survival in the ENDEAR study[8]*

was sham-control), 15-month long Phase 3 clinical trial assessing the safety and efficacy of nusinersen in 126 children ages 2 to 12 with later-onset SMA (onset of SMA symptoms at age > 6 months).[9] The primary end point was the least squares mean change from baseline in the Hammersmith Functional Motor Scale–Expanded (HFMSE) score at 15 months of treatment; HFMSE scores range from 0 to 66, with higher scores indicating better motor function. Interim analysis showed that patients receiving nusinersen experienced a mean improvement in Hammersmith Functional Motor Scale - Expanded score of 4.0 points compared to a mean decline of 1.9 points seen in sham procedure control subjects (P<0.001).[9] At the end of the study, mean improvement in HFMSE score was 3.9 points for the nusinersen group and mean decline of 1.0 points in the control group.[9] **(Figure 4)** It also showed that 57% of patients in the nusinersen group were considered HFMSE responders (defined as a child with ≥3-point increase from baseline in HFMSE at Month 15) versus 26% in the control group (P<0.001).[9]

The overall incidence of adverse events was similar

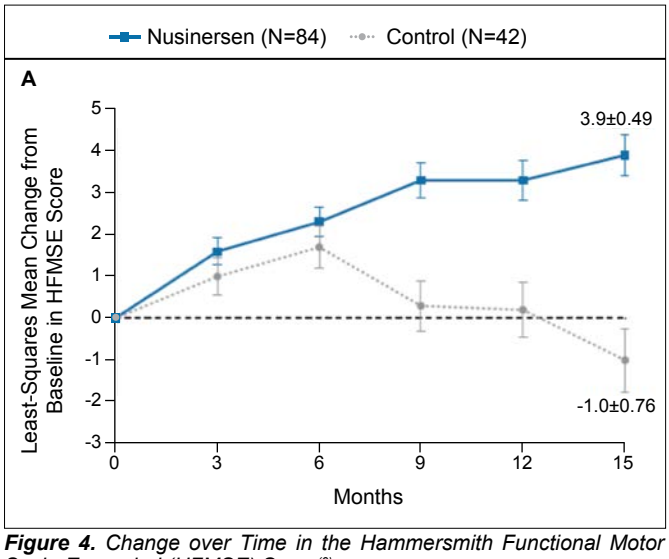

Figure 4. *Change over Time in the Hammersmith Functional Motor Scale-Expanded (HFMSE) Score[9]*

in the nusinersen group and the control group (93% and 100%, respectively).[9] A lower percentage of infants in the nusinersen group than in the control group had a serious adverse event. (17% vs. 29%)[9]

Safety Precautions & Monitoring

Coagulation abnormalities and thrombocytopenia, including acute severe thrombocytopenia, as well as renal toxicity, including potentially fatal glomerulonephritis have been observed after administration of some antisense oligonucleotides.[7] The most common side effects of nusinersen include lower respiratory infection, fever, constipation, headache, vomiting, back pain, and post-lumbar puncture syndrome.[7]

Most recently on 26 September 2018, the Department of Health issued a Letter to Healthcare Professionals, drawing our attention to reports of possible association of communicating hydrocephalus with nusinersen therapy.[10] Healthcare professionals are advised to discuss with patients and carers and closely monitor patients on nusinersen should they develop any signs and symptoms of hydrocephalus, such as persistent vomiting or headache, seizures, decreased consciousness or a rapid increase in head size.[10]

ONASEMNOGENE ABEPARVOVEC-XIOI (Zolgensma®)

In May 2019, the U.S. Food and Drug Administration approved a gene therapy, onasemnogene abeparvovec-xioi (Zolgensma®), to treat spinal muscular atrophy in children less than 2 years of age with bi-allelic mutations in the SMN1 gene. The gene therapy makes use of adeno-associated virus serotype 9 (AAV9), which crosses the blood-brain barrier, as a vector to deliver a SMN-protein coding gene to patients' cell nuclei.[11] The targeted gene can then be transcribed and translated to produce healthy SMN protein. The recommended dosage is 1.1 x 10^{14} vector genomes (vg) per kg of body

weight, to be given as a single dose IV infusion only.

The efficacy and safety of onasemnogene abeparvovec-xioi were demonstrated in the START trial and the on-going STR1VE trial.

Phase 1 trial evaluating safety of onasemnogene abeparvovec-xioi: the START Trial

START trial is a non-randomized, open-label, single-arm, dose escalation phase I clinical trial.[12] A total of 15 patients with the diagnosis of Type 1 SMA confirmed by genetic testing were recruited. The primary outcome was safety and the secondary outcome of the trial was survival, including avoidance of death and permanent assisted ventilation.[12] The subjects were divided into two cohorts to receive a single dose of onasemnogene abeparvovec-xioi, subjects in Cohort-1 (n=3) received a lower dose at 6.7 x 10^{13} vg/kg and subjects in Cohort-2 (n=12) received a higher dose at 2.0 x 10^{14} vg/kg.[12] At the end of the study period, all subjects remained alive.[11] The safety primary endpoint was not described in the published report after study completion.[13] As for the secondary endpoint, all subjects remained alive; out of all study subjects, one patient from cohort-1 required permanent assisted ventilation.[11]

Phase 3 study evaluating efficacy and safety of onasemnogene abeparvovec-xioi: the STR1VE Trial

STR1VE is an on-going, open-label, single-arm, multi-centre Phase 3 clinical trial, evaluating the efficacy and safety of onasemnogene abeparvovec-xioi in patients with Type 1 SMA.[14] Twenty one patients with infantile onset SMA were recruited and all patients received a single dose of 1.1 x 10^{14} vg/kg onasemnogene abeparvovec-xioi IV infusion.[14] The primary outcomes measured were independent sitting for at least 30 seconds at 18 months, and survival at 14 months.[14] As of March 2019, 19 subjects (90.5%) survived without the need of permanent ventilation, and 10 out of 21 patients (47.6%) were able to sit without support for at least 30 seconds.[11] The study is still ongoing at the time of writing and is projected to finish by end of 2019.

Safety Precautions & Monitoring

Acute serious liver injury and elevated liver enzymes have been reported after the administration of onasemnogene abeparvovec-xioi. Liver function assessment (such as measurement of hepatic aminotransferases, total bilirubin level and prothrombin time) is recommended at baseline and at regular intervals after infusing onasemnogene abeparvovec-xioi.[11] Systemic corticosteroid should be administered before and after drug infusion.[11]

Thrombocytopenia and transient increase in troponin-I have also been reported after drug infusion.[11] Clinicians are advised to measure platelet and troponin-I levels at baseline and at regular interval after administering this drug.[11]

CONCLUSION

Both nusinersen and onasemnogene abeparvovec-xioi are groundbreaking advancements in the treatment of SMA, with the potential to improve patients' survival, motor function and quality of life. However, the drug costs are ultra-high, limiting their accessibility to most patients unless subsidy is available. The long-term safety and efficacy data are yet to be determined. While these treatments bring new hope to SMA patients and their family, whether the ultra-high treatment cost is justified is yet to be determined until more long term data are available.

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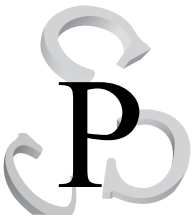
Questions for Pharmacy Central Continuing Education Committee Program

(Please be informed that this article and answer sheet will be available on PCCC website concurrently. Members may go to PCCC website (www.pccchk.com) to fill in their answers there.)



2 CE Units

Spinal Muscular Atrophy: A Treatment Update

1. ***Which of the following is the first disease modifying treatment approved for spinal muscular atrophy?***
   A. Eteplirsen
   B. Nusinersen
   C. Onasemnogene abeparvovec-xioi
   D. Omalizumab

2. ***Which of the following statements is FALSE regarding spinal muscular atrophy (SMA)?***
   A. SMA disease severity is related to SMN protein activity.
   B. SMA is caused by overexpression of SMN2 gene, which produces nonfunctional SMN proteins.
   C. The number of SMN2 gene copies varies among SMA patients.
   D. In SMA patients, mutations in chromosome 5q13 lead to SMN protein deficiency.

3. ***Which of the following statement(s) are true regarding the ENDEAR trial?***
   (i) It is a randomized, double blind study for infants who are 7 months of age or younger.
   (ii) It shows that nusinersen is comparable to corticosteroid in delaying disease progression in SMA.
   (iii) The primary endpoint of the study is the safety profile of nusinersen.
      A. (i) only
      B. (iii) only
      C. (i) and (iii)
      D. (ii) and (iii)

4. ***A letter of Healthcare Professionals was issued by Department of Health warning about the use of nusinersen, due to its possible association with:***
   A. Aseptic meningitis
   B. Neuroblastoma
   C. Hydrocephalus
   D. Autoimmune encephalitis

5. ***The CHERISH trial shows that:***
   A. Patients who received nusinersen had a higher incidence of serious adverse event compared to the control group.
   B. Patients who received a single dose of onasemnogene abeparvovec-xioi had a higher rate of disease remission than those who received nusinersen.
   C. Higher percentage of patients in the nusinersen group was considered “HFMSE responders” compared to those in the control group.
   D. A higher dose of nusinersen corresponds to a better treatment outcome.

6. ***Which of the following are reported side effects of nusinersen?***
   (i) Renal toxicity
   (ii) Post lumbar puncture syndrome
   (iii) Constipation
      A. (i) only
      B. (i) and (ii)
      C. (ii) and (iii)
      D. (i), (ii) and (iii)

7. ***Which of the following statement is correct regarding the mechanism of onasemnogene abeparvovec-xioi?***
   A. It is an antisense oligonucleotide, binding to a specific sequence downstream of exon 7 of the SMN2 transcript.
   B. It causes exon 7 exclusion in SMN2 mRNA transcripts, leading to the production of full length stable SMN protein.
   C. Adeno-associated virus serotype 9 (AAV9) is used as a vector, blocking the delivery of defective SMN2 gene to the patient’s cell nuclei.
   D. None of the above

8. ***Which of the following is correct regarding the STR1VE trial?***
   A. It is a single arm clinical trial where all patients receive onasemnogene abeparvovec-xioi.
   B. The primary outcome of the study is survival rate.
   C. It showed that higher dose of onasemnogene abeparvovec-xioi is associated with higher risk of liver toxicity.
   D. Type 1 and Type 2 SMA patients were recruited as subjects.

9. ***Which of the following are reported as potential side effects of onasemnogene abeparvovec-xioi?***
   (i) Elevated troponin-I level
   (ii) Acute liver injury
   (iii) Thrombocytopenia
      A. (i) and (ii)
      B. (ii) and (iii)
      C. (i) and (iii)
      D. (i), (ii) and (iii)

10. ***Which of the following statement is incorrect regarding onasemnogene abeparvovec-xioi?***
    A. It should be given intrathecally.
    B. It is only licensed to be given as a single dose.
    C. The dose is adjusted according to the patient’s body weight.
    D. It is licensed for the treatment of SMA children less than 2 years of age with bi-allelic mutations in the SMN1 gene.

Answers will be released in the next issue of HKPJ.

CE Questions Answer for 262(D&T)

An Overview and Update on the Management of Severe Asthma

1. B 2. D 3. A 4. D 5. C 6. C 7. B 8. D 9.D 10. D

ADVANCING THE FRONTIER OF PRIMARY CARE PHARMACY TOGETHER

PRIMARY CARE PHARMACY CONSORTIUM 2019

HKU Med LKS Faculty of Medicine Department of Pharmacology & Pharmacy 香港大學藥理及藥劑學系

Pharmacy HKU 10

藥劑連線 Pharmacists Connect

A Milestone for a New Landscape of Hong Kong Primary Care Pharmacy Service

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Jointly organised by the Department of Pharmacology and Pharmacy, the University of Hong Kong (HKU), and Pharmacists Connect, the **Primary Care Pharmacy Consortium 2019** (the Consortium) was successfully held on 23 June 2019 at the Centennial Campus, HKU.

The event signifies the engagement and concerted efforts by the Consortium to foster the networking and collaborations between social welfare sector, healthcare sector, and academia on:

- Planning, implementation, and evaluation of primary care pharmacy services;
- Research to guide evidence-based pharmacy practice in primary care setting;
- Education to nurture the next generation of leaders in primary healthcare system.

The Consortium has invited guest speakers and participants from non-governmental organisations (NGOs) and different healthcare settings.

During the sharing sessions, several local community-based providers shared their visions, experiences, opportunities, and challenges in delivering pharmacy services in different areas:

- Primary Care Pharmacy - Current Landscape
  - Community outreach
  - Medication dispensing and management
  - Medication systems and technologies
- District Health Centre - The Way Forward

Throughout the programme, speakers and the floor contributed insightful comments and ideas through online chatroom and discussion sessions.

This report presents the key insights that have been generated in the Consortium regarding the development of Hong Kong primary care pharmacy services. The report also provides abstracts of the sharing by each guest speaker.

KEY INSIGHTS

Research to Improve Patient Care and Outcomes

- Further research on local primary care pharmacy services is needed
- To generate knowledge that guides the improvement of patient care and outcomes
- To evaluate and demonstrate the impact of primary care pharmacy services to guide evidence-based care delivery

- To measure outcomes that reflect reduction in healthcare cost and improvement of patient outcomes as the result of service. For instance, the savings by preventing drug-related problems and unplanned admissions

Data Infrastructure for Pharmacy Service

- Community-based providers need a platform to document and evaluate pharmacy services under a standardised data framework
- Computerised platform will facilitate data collection and utilisation for impact evaluation and research
- Integration with existing systems, e.g. Electronic Health Record Sharing System, is preferred over the development of a separate stand-alone system

Service Sustainability

- Pharmacy services need evidence of healthcare cost reduction to increase the buy-in by service funding and policymakers

Collaborations to Improve Service Delivery

- Public health system can outsource drug refill service to community and NGO pharmacies
- Primary care providers and public health system can collaborate to enhance the continuity of care, and to better utilise services and resources, e.g. management of discharged patients in the community, referral framework
- Healthcare providers can explore measures to facilitate access to patients' medication profiles in the community setting, e.g. patient's copy of medication list, app that can read the barcodes on drug labels of Hospital Authority

Pharmacy Service at District Health Centres

- Pharmacists at District Health Centres (DHCs) can focus on screening, public health and medication education, and pharmaceutical services such as medication review and reconciliation
- In the multidisciplinary setting at DHCs, pharmacists need to go beyond medication management to deliver holistic patient care with other healthcare professionals, e.g. chronic pain management
- DHCs can serve as a bridge between public health services and community-based services to improve patient care across settings
- Collaboration between DHCs and community pharmacies can be explored for screening, management of minor ailments, frameworks for bi-directional patient referral, interventions, and case management
- Evaluation of service outcomes is crucial to establishing a sustainable model for DHCs across the territory

Consortium - The Way Forward

- The Primary Care Pharmacy Consortium serves to gather experience, to share resources and to foster collaborations among local healthcare and social service stakeholders in planning, implementing and evaluating primary care pharmacy services
- The Consortium can address the local needs for primary care pharmacy services by constructing and promulgating service models to promote sustainable and scalable implementation
- Collaborations between service providers and academia on research and data infrastructure will generate knowledge that transforms healthcare practice and policy
- The Consortium enables the engagement with the public, other professions, and policymakers to drive further development of primary care pharmacy services

SHARING SESSION ON CURRENT PRIMARY CARE PHARMACY SERVICES - ABSTRACT

The Consortium has invited local community-based providers to share their experiences and perspectives on a spectrum of primary care pharmacy services. For the full programme and presentation slides, please visit www.pcpc.hku.hk.

COMMUNITY OUTREACH

藥到病除 長者藥物管理計劃

Aberdeen Kai-fong Association Social Service, and
The University of Hong Kong

As a collaboration between Aberdeen Kai-fong Association Social Service and HKU Department of Pharmacology and Pharmacy, the outreach project has arranged home visits for elderly patients in the Southern District over the past 4 years.

The service targets at elderly with limited caregiver support and difficulties in managing their medications. Regular home visits were conducted by teams of HKU pharmacy students who were supervised and supported by registered pharmacists and social workers.

The home visit teams assess the health status and review the medication management of the elderly every 1-2 months. Education and interventions are provided on an as-needed basis. After receiving the service, participants reported better understanding of drug administration, potential consequence of co-administering traditional Chinese medicine with western ones. Some reported fewer adverse effects after pharmacists' interventions.

HKU had conducted a study to evaluate the effectiveness of the outreach service in 2017-19. In the study, drug-related problems can be detected in 93.5% of the elderly. Over 60% of the drug-related problems can be attributed to patient-related factors that are amenable to education and interventions.

Home visits offer opportunities for on-site comprehensive review of health and medication management by the elderly, e.g. storage condition, in their own living environment. Home visits built trust between the elderly and the visiting team, and participants were more willing to share information about their health and medication practices.

藥到病除 長者藥物管理計劃：Health assessment and medication review during home visit.

CU CHAMPION

The Chinese University of Hong Kong

Community Health And Medication-safety Promotion Inter-school Outreach Network (CU CHAMPION) is a multidisciplinary service team established by the Chinese University of Hong Kong in 2013. Students, teachers, and alumni of different health disciplines and social work deliver outreach service to promote healthy lifestyle and medication safety in the community. The team provides health check, disease screening, and on-site professional consultation at community centres.

CU CHAMPION Community Outreach Services - Health and medication consultation.

CU CHAMPION outreach service has successfully engaged many participants and identified common health problems in the elderly population. However, there have been difficulties in reaching the hidden or less health-conscious elderly. Follow-up on the long-term impact on elderly's behavioural change has been challenging too.

A primary care project has been initiated to develop the social capital and to build a healthy community in Sham Shui Po District. CU CHAMPION collaborated with local NGOs in conducting outreach service, volunteers training, and case follow-up. The initiative has also engaged community pharmacists and Chinese medicine practitioners in providing follow-up management to selected elderly participants. This connected the providers of social service and healthcare, and facilitated the integration of community pharmacies into the community care network.

DISCUSSION

Concerning the methods to evaluate the clinical outcomes or benefits of the services, both projects have documented the rates of interventions and acceptance by prescribers. Outcomes such as mortality or admission rates were difficult to obtain in the setting within the limited time frame. The projects would look into expanding the sample size and exploring more impactful outcome measures.

MEDICATION DISPENSING AND MANAGEMENT

Kwai Tsing Community Health Management Hub

Health In Action

Aiming to enhance health among working poor and their family members, Health In Action (HIA) has established the Kwai Tsing Community Health Management Hub (the Hub) to deliver person-centred care through family-based and multidisciplinary approach.

The multidisciplinary team at the Hub comprises nurses, nutritionist, pharmacist, physiotherapist, public health specialist, doctor volunteer, and social worker. The team's synergy enables HIA to deliver holistic and flexible one-stop health services to the community members. The goal is to promote health equity by enhancing access to health care.

At the Hub's community pharmacy, the pharmacist works closely with the multidisciplinary team in delivering primary care services, such as management of minor ailments, smoking cessation, advice on medications and lifestyle changes.

By integrating a community pharmacy into the multidisciplinary model, HIA anticipates that pharmacists will contribute to different health interventions, such as vaccination, health literacy enhancement, case triage, so as to further strengthen their role in the primary care setting.

Health In Action Community Pharmacy - Opening Ceremony

Health In Action - Exercise session led by physiotherapist

Health In Action - Train-the-trainer workshop on healthy diet

Health@Community 健康・友里

Bliss District Elderly Community Centre, Hong Kong Christian Service

The Health@Community project was initiated in Kwun Tong District to empower community-dwelling elderly to prevent and self-manage chronic medical conditions.

The project comprises three levels of interventions:

- Enhance knowledge and awareness among elderly and volunteers
- Engage and empower volunteers in the neighbourhood
- Identify and manage high-risk elderly

As a service partner, Pharmacists Connect provided consultation service on disease and medication management to the high-risk elderly at the community clinic. Through teleconsultation, the pharmacist counselled the elderly on proper use of medication, identified and managed drug-related problems. The use of teleconsultation helped the elderly to overcome mobility and geographical barriers to gain access to the health facilities in the district. The service also reduced the elderly's dependence on the public health services.

Health@Community - Pharmacist counselled elderly on medications via video call

Primary Care Services at Philanthropic Community Pharmacy

St. James' Settlement

In 2009, St. James' Settlement set up the first non-profit community pharmacy in Hong Kong, Philanthropic Community Pharmacy. The pharmacy is now serving in Wan Chai, Sham Shui Po, Kwun Tong, and Sha Tin.

With the implementation of Hospital Authority Drug Formulary, patients have to pay out-of-pocket for medications listed as self-financed items (SFIs). In partnership with charity donor, the Philanthropic Community Pharmacy provides SFI medications to target patient groups at an affordable cost. This reduces financial barriers to access to essential medications for the grassroots.

Besides ensuring equitable access to essential medications, the Philanthropic Community Pharmacy also provides professional consultation service on medication and health-related issues. The service aims to empower patients to properly use medications and to self-manage their conditions. The pharmacists monitor patients for adherence and drug-related problems, and they intervene accordingly as necessary. Access to patient's medical history on the Electronic Health Record Sharing System facilitates the delivery of pharmaceutical care and communication with other healthcare professionals.

At St. James' Settlement, pharmacists also take part in other services, for example, public health talks, outreach, and other non-drug subsidy programmes.

DISCUSSION

Financial feasibility of the medication dispensing, and management services was discussed. The existing service models are implemented based on funding. Financial sustainability beyond the funding period is less certain. On the other hand, cost of service may be recovered by the medication charges.

Promotion of the roles of pharmacists in the primary care setting, for instance public health talks, can boost the utilisation and hence sustainability of the community medication management services.

MEDICATION SYSTEM AND TECHNOLOGIES

Medication Dispensing and Management Services

Hong Kong Pharmaceutical Care Foundation

Medication management in residential care homes for elderly (RCHE) can be complicated. Elderly patients often have complex medication profiles and receive care from multiple healthcare providers. Dispensing and medication management in most RCHE lacks input from pharmacist and represents a significant work burden on the staff.

The Hong Kong Pharmaceutical Care Foundation offers a spectrum of pharmacy services to improve medication safety in the RCHEs. Visiting pharmacists assist RCHE to comply with guidelines on medication management, including record keeping, storage, dispensing, and distribution. Visiting pharmacists also review and reconcile the medication profiles of the elderly residents to ensure accuracy and appropriateness of the regimen. The pharmacists also deliver education and training sessions to elderly patients and care providers.

The Foundation has also developed an electronic medication management system and automation to support the digitalisation of record keeping, dispensing, distribution, and administration of medications in RCHEs.

The Foundation envisages that the medication management system and technologies can be further applied to benefit individual patients in the community. RCHEs and day care centres should involve pharmacists and dispensers in the care team to support medication management and pharmaceutical care services.

The Implementation of Pharmacy Automation in the Rehabilitation Setting

TWGHs Jockey Club Rehabilitation Complex

The Jockey Club Rehabilitation Complex (JCRC) of Tung Wah Group of Hospitals is serving over 1000 users with different demographic characteristics, such as mentally challenged cases and visually impaired older adults.

Medication management process at JCRC was originally handled by nursing staff. Owing to the large caseload, the process was labour-intensive and time-consuming.

To streamline the medication management process, JCRC introduced centralised and computerised medication management system and automation to support medication dispensing and checking. The system is overseen by an in-house pharmacist, who:

- Devises and implements medication supply workflow
- Ensures compliance to medication management guidelines
- Participates in developing closed-loop medication administration system
- Provides pharmaceutical care to residents, e.g. medication reconciliation, education
- Trains nursing staff on medication knowledge
- Engages residents and caregivers in health promotion

The use of computerised system and automation has raised the standard of practice. It also minimises manual workload and human errors during medication handling. Quality of care is enhanced when the nursing staff can focus on direct patient care, and that residents can receive pharmaceutical care from pharmacists.

This project extends pharmaceutical care to special patient populations in the rehabilitation setting. It also serves as a model of in-house pharmacy services in mega-sized long-term care facilities.

依藥盒 MEDeliver

MEDeliver

Inspired by the need of older adults with cognitive impairment and inadequate social support, MEDeliver is a smart pillbox system designed to enhance medication adherence among older patients through reminders and remote monitoring.

It is hoped that the service can be expanded to benefit more elderly patients in the community.

SHARING SESSION ON KWAI TSING DISTRICT HEALTH CENTRE

The Consortium has invited Mr. Peter Poon, Executive Director of Kwai Tsing District Health Centre (DHC), to introduce the brand-new operation model in primary care setting. For the presentation slides, please visit www.pcpc.hku.hk.

Initiated and supported by the government, DHC is a new model of medical-social collaboration in Hong Kong primary care setting. The first DHC at Kwai Tsing is operated by Kwai Tsing Safe Community and Healthy City Association. Kwai Tsing DHC serves as the pilot for subsequent DHCs that will be gradually set up in all 18 districts.

Besides the core centre, five satellite centres will be set up to expand the service to whole district.

Kwai Tsing DHC will provide various healthcare services including health promotion and education, health assessments and chronic disease management. The major mode of service initiation is when users present themselves at the centre for their health concerns. Kwai Tsing DHC is also connected to a network of private general practitioners who may refer patients to the DHC.

EMPOWERMENT AND ENGAGEMENT

Kwai Tsing DHC focuses on empowering people to actively participate in managing their own well-being and health conditions.

Users at the Centre or outreach service will undergo disease screening and baseline risk assessment. Subsequently, care coordinators will act as health coaches and guide users to set goals and to take actions to improve their lifestyle and health. They will also assist the users to navigate the services in the district health network and follow up on the individual's self-management plan.

At the DHC, the multidisciplinary team will deliver workshops and rehabilitation programmes to support self-management of health conditions, for example, diabetes mellitus, stroke, post-fracture, low back pain, and cardiac rehabilitation.

By increasing the awareness and capacity of self-care in the community, DHC envisages to drive a reduction in demand for formal health and social services.

DISCUSSION SESSION ON PHARMACY SERVICE AT DISTRICT HEALTH CENTRES

Following the sharing session on Kwai Tsing DHC, the Consortium focused the discussion on the pharmacy service at DHC.

Kwai Tsing DHC has no plans to set up a pharmacy in the early stage. They are looking into available resources and service opportunities for pharmacists to collaborate with other healthcare professionals and to reach out in the community.

Kwai Tsing DHC is looking forward to collaborations with community pharmacies. Possible services for collaboration have been suggested: disease screening, management of minor ailments, care coordination, and case management.

Besides collaboration with other community pharmacies, Kwai Tsing DHC hopes to map the community resources, e.g. pharmacy service, and present to patients with chronic diseases. The DHC team will observe the needs in the community and expand services accordingly.

The discussions brought some suggestions on the potential role of DHC pharmacist:

- Disease screening and risk assessment
- Public education on health promotion such as smoking cessation, and medications use
- Pharmaceutical care services, such as medication review and reconciliation

In view of the multidisciplinary setting at DHC, pharmacist needs to go beyond the traditional role of medication management and to deliver holistic patient care together with other healthcare professionals in areas such as chronic pain management.

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Prevention and Management of Non-Communicable Diseases in Community Pharmacy: a Health Coaching Approach

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ABSTRACT

Non-communicable diseases (NCDs) are diseases of long duration and account for over 50% annual deaths worldwide and in Hong Kong. Most NCDs are the result of four behavioural risk factors, namely tobacco use, physical inactivity, unhealthy diet, and harmful use of alcohol. Modification of these behaviours can help preventing and managing NCDs, and hence lessening the NCD burden. Health coaching is applied in various contexts to promote health behaviours. It is a service in which the patient and the coach have collaborative patient-centred interactions, aiming at a behavioural change through the process of goal determination and follow-up. Community pharmacy is an appropriate setting for health coaching because it is easily accessible, and pharmacists are knowledgeable in the screening, prevention, and treatment of NCDs. Communication and consultation skills play an important role in health coaching. Centre for Pharmacy Postgraduate Education has listed ten key principles for health coaching. To prepare pharmacists to provide such services, lifestyle medicine should be included in pharmacy education, and formal health coaching training should be available in pharmacy continuing education. Pharmacists share the responsibility to promote health. Despite the barriers to provision of formal health coaching, Hong Kong community pharmacists can contribute to the prevention and management of NCDs by incorporating elements of health coaching into the routine practice, hence to increase individual's knowledge and awareness of their health behaviours.

Key words: *Community pharmacy, health coaching, lifestyle modification, non-communicable disease, pharmacist*

INTRODUCTION

Non-communicable diseases (NCDs) are diseases of long duration and are associated with a combination of genetic, physiological, environmental and behavioural factors. There are four main types of NCDs: cardiovascular diseases, cancers, chronic respiratory diseases and diabetes.[1] The World Health Organization (WHO) estimated that every year NCDs account for deaths of about 32.5 million people, with cardiovascular diseases account for the most annual deaths, followed by cancers, respiratory diseases, and diabetes.[1] Most NCDs can be attributed to the four behavioural risk factors, namely tobacco use, physical inactivity, unhealthy diet, and harmful use of alcohol. These behaviours result in metabolic or physiological changes such as raised blood pressure, blood glucose or cholesterol, as well as overweight or obesity. Since these behaviours are modifiable, reduction of these major risk factors will lessen the global NCD burden.[1]

NCDs IN HONG KONG

NCDs is an important cause of death in Hong Kong. Of the 46,662 registered deaths in 2016, about 55.2% were attributed to cancer, heart diseases, stroke, chronic lower respiratory diseases and diabetes.[2] The Population Health Survey 2014/2015 conducted by the Department of Health showed that up to 50% of individuals aged 15 to 84 were overweight or obese and 49.5% had hypercholesterolaemia. The survey also revealed that the prevalence of hypertension and diabetes mellitus reached 27.7% and 8.4% respectively. Regarding behavioural risk factors, the survey observed that 86.3% of this population had excessive salt intake. For persons aged 15 and above, 94.4% had insufficient fruit and vegetables consumption, 61.4% had alcohol drinking habit, 19.1% had prolonged sitting or reclining each day, 14.8% had cigarette smoking habit, and 13.0% had inadequate physical activity.[3] As a result, the Hong Kong Government launched "Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong" in 2018 to encourage individuals to modify unhealthy behaviours and live in healthy ways.[2]

WHAT IS HEALTH COACHING?

A recent review by Singh et al. defined health coaching as a service provided to patients by health care professionals for disease management or health risk prevention.[4] The patient and the coach have collaborative patient-centred interactions, aiming at a behavioural change through the process of goal determination and follow-up. The coach delivers expert information and motivates the patient to achieve the goal. Both the patient and the coach are held accountable for the patient outcomes.[4]

Health coaching has been applied in various contexts to improve health behaviours. For example, in 2006, the Swiss College of Primary Care Medicine developed a "Health Coaching Project" for behavioural counselling and health promotion in primary care. The coaching programme consisted of a communication training for general practitioner (GP), a change of roles and shared responsibility between GP and patient, the provision of counselling in reference to trans-theoretical model of behaviour change, and an emphasis on patient-centred health-related decisions.[5] 50% of the participants who completed the counselling programme achieved improvement in health behaviour ratings.[5] Hence the authors suggested extending such programme to other health care professionals.

Later, DiDonato et al. explored the effectiveness of health coaching in community pharmacy setting.[6] An employee wellness programme was implemented to assess the clinical and patient-centred outcomes of health coaching provided by community pharmacists, such as mean changes in lipid profile, blood pressure, fasting blood glucose, weight, body mass index (BMI), and waist circumference.[6] Instead of specific certificate training, pharmacist coaches in this study were guided by a training manual with disease modules, a clinical guideline review, and a hands-on training session on physical assessment. The authors concluded that coaching and monitoring provided by community pharmacists can generate significant improvements in cardiovascular risk factors. Moreover, the authors suggested that other than specific program training and pharmacy education, additional certification might not be necessary to launch the coaching service at community pharmacies.[6]

KEY PRINCIPLES OF HEALTH COACHING

Although there is a variety of health coaching practice models, they share common elements.[7] In a distant learning programme on consultation skills for pharmacy practice, the Centre for Pharmacy Postgraduate Education (CPPE) underpinned the principles of health coaching:[8]

(i) work in partnership with patients, while the patient sets the agenda of meeting
(ii) believe in the capability of the patient to recognize and solve their own problems and set their own goals
(iii) reassure the patient to take an active role in their healthcare
(iv) encourage patient accountability and responsibility for the chosen outcome
(v) explore various options for the patient
(vi) initiate a balanced discussion of the risks and benefits of potential options
(vii) apply an appropriate level of challenge to support patients in addressing barriers or unhelpful beliefs about their medications or health
(viii) allow the patient time to think and consider, hold back and refrain from giving advice at the first opportunity
(ix) support patients to choose their preferred option, instead of having the healthcare professional to make the decision
(x) use a holistic approach in order to support patients undergoing sustainable change.

Skills required for effective health coaching

Communication and consultation skills play an important role in health coaching. According to CPPE, skills such as active listening, taking a non-judgemental approach, using appropriate questioning techniques or motivational interviewing, and reflecting back to the patient contribute to an effective coaching.[8]

In addition, a qualitative study demonstrated that peer relationship, availability and persistence, a strong and trusting relationship, provision of personal and practical support, and bridging between patients and their clinicians are important to successful coaching.[9]

It is worth noting that there are red-flag situations in which a direct approach should be adopted to ensure patient safety. Based upon their profession knowledge and judgement, pharmacists should inform patient of the risks and correct inaccurate beliefs. They should offer evidence-based information and refer patient to other health care professionals for further support if appropriate.[8]

HEALTH COACHING BY PHARMACISTS

Pharmacists have been trained in the screening, prevention, and treatment of NCDs. Pharmacists and all health care professionals share responsibility for health promotion. In fact, health coaching takes place informally in the pharmacy setting regularly.[10] Therefore, with the knowledge, skills and experience, the pharmacy workforce is capable of providing health coaching service.

Currently, community pharmacists are contributing in the Lifestyle Change Program, the key component of the National Diabetes Prevention Program (National DPP) led by the Centers for Disease Control and Prevention of the United States.[11] By expanding the reach of the National DPP, community pharmacists can prevent new cases of type 2 diabetes among high-risk patients.[11] The pharmacy workforce can support the efforts by taking parts in one or more of the three levels: (i) promoting awareness of prediabetes and the National DPP among patients at risk; (ii) screening, testing, and patient referral; and (iii) offering the National DPP Lifestyle Change Program. Pharmacy staff members are viewed as good lifestyle coaches because they are familiar with patient care and motivational interviewing techniques.[11]

IMPLEMENTATION OF HEALTH COACHING IN COMMUNITY PHARMACIES IN HONG KONG

Nowadays, besides supply of medications and ensuring the rational use of medications, community pharmacists contribute in health promotion campaigns and education of local community groups in health promotion.[12] According to a report from International Pharmaceutical Federation, community pharmacists offer quick and qualified support to patient needs, and thus are ideally placed to take part in prevention of NCDs. Their key interventions include tobacco cessation, weight management and promotion of healthier lifestyles.[13] In Hong Kong, community pharmacies are easily accessible, and pharmacists can develop a trusting relationship with people. Community pharmacists provide lifestyle modification counselling or address health related issues during client or patient encounters. Although it might be difficult to provide formal health coaching owing to barriers such as lack of private consultation area, limited access to health record, difficulty in follow-up, lack of time, or commercial pressure from pharmacy owners, pharmacists might incorporate elements of health coaching into interaction with certain clients or patients. For example, as proposed by Lonie et al, initial target patients could be those with chronic health conditions that are suboptimally controlled despite the best effort of health care professionals.[14] A health coaching approach might increase patients' knowledge and awareness about how their health behaviours relate to NCDs and how they could seek support from health care professionals.

As suggested by White, in order to expand health coaching in the pharmacy setting, pharmacists need to be better prepared and supported to provide such services.[10] For instance, besides knowledge about NCDs, a standardised approach to teaching and assessing lifestyle medicine is needed in pharmacy education, and formal health coaching training should be available as continuing education programme for the profession. Moreover, greater awareness of successful practice models of health coaching by pharmacists also contribute to optimisation of this valuable patient care resource.[10] Appropriate training on coaching skills and government policy supporting the role of pharmacists in primary care will empower pharmacists to improve the public health through modification of unhealthy behaviours and health promotion.

CONCLUSION

Health coaching can facilitate sustainable behaviour change and reduce risk factors for NCDs. With health coaching by health care professionals, people develop a sense of responsibility in their health behaviours, set their goals and work towards their goals through the patient-centred interactive sessions. In view of the unique skills and capabilities of the pharmacy workforce, community pharmacy is an appropriate setting for health coaching. Despite the barriers faced by community pharmacists in Hong Kong, incorporating elements of health coaching into the routine practice can increase people's knowledge and awareness of their health behaviours, hence contribute to the prevention and management of NCDs.

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Potential Pharmacist Roles in Hong Kong: Provision of Travel Health Advice

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ABSTRACT

There is an increasing number of outbound tourists in Hong Kong every year. However, it was found that local awareness to travel health is low and there are limited providers of pre-travel consultation advice in Hong Kong. In response to the situation, pharmacists working in the primary care setting should equip themselves and expand their role to provide advice pertinent to travel-related diseases. Besides providing education and suggestions to patients, pharmacists can also recommend appropriate vaccinations or prophylactic medication regimens to physicians. This article aims to highlight how practising pharmacists could handle patients seeking travel health advice and to review the role of pharmacist in prevention of four commonly enquired travel-related illnesses – traveller's diarrhoea, altitude sickness, malaria, and yellow fever.

Keywords: *Travel Health; Primary Care; Community Pharmacy; Pharmacist; Vaccines*

INTRODUCTION

In Hong Kong, the number of outbound tourists is growing each year with an estimated 5.8 million outbound trips in 2016 and it is expected to reach 6.8 million in 2021.[1] However, it was found that travellers had low awareness of health risks associated with tourism. According to a study conducted in Hong Kong International Airport in 2013,[2] it was found that only around 15% of subjects interviewed had consulted a physician or travel health specialist and received advice on endemic diseases and were given appropriate vaccinations or medications before departure. The result showed a need of raising public awareness about travel health and provision of related services in Hong Kong. Currently, general public could seek travel health advice from various sources in Hong Kong including general practitioners (GP), travel health centres operated by the Department of Health, or some private travel clinics.[3] However, challenges unique to these providers may limit their services. GP clinics may carry inadequate stock of various vaccines and specialised travel medications. Advanced booking is required in public travel health centres, while the cost of seeking consultation from private providers may be prohibitively high for some travellers.

In response to the situation, pharmacists involved in providing primary care, such as those working in community pharmacies and general out-patient clinics could be utilised to fill this service gap in Hong Kong. Pharmacists are well-positioned to provide advice to patients or physicians on medications or vaccinations related to the prevention or self-treatment of travel-related diseases. Similar services provided by pharmacists had been started in the United States and were shown to be effective in helping to expand patient access to travel health service[4] and are well-received.[5] This article aims to highlight the role of pharmacists in providing pre-travel health advice, therefore techniques of acquiring reliable information and pharmacist role in the prevention of commonly enquired travel-related illness will be discussed.

GATHERING INFORMATION

When approached by clients seeking pre-travel health consultation, several pieces of information are essential for risk assessment and formulating suggestions. Detailed travel itinerary including countries and regions of destinations, intended period of visit, and means of transportation should be obtained. Pharmacists should also discuss planned activities with clients as travellers involved in sports activities or seeking adventurous eating experience might present different risks than those whose main goal is tourism. Besides trip details, medical history of the client should also be recorded. This might include chronic diseases, current medications, immunisation history, and special conditions such as pregnancy or breastfeeding. After gathering adequate information from clients, pharmacists can then formulate their response by consulting various sources.

Several sources are available for providing travel health information and are summarised in **Table 1**. An online website of Travel Health Service maintained by the Department of Health is available for enquiring information of travel-related disease and available vaccinations.[6] Current travel health news such as outbreak of diseases around the world and travel alerts can also be found. The site also contains the locations and contacts of the two local travel health centres for consultation. The educational information on the site is written in layman's terms and is available in both Chinese and English, it therefore represents a valuable resource to the general public.

The Centers for Disease Control and Prevention (CDC) of the United States has also set up a website dedicated to providing travel health information.[7] Apart from travel health news, travellers or healthcare providers can obtain detailed recommendations based on travel destination and special travel needs. For travellers who could provide detailed plans of their trip, pharmacists can make use of this website and provide recommendations on required vaccines and patient counselling points. For pharmacists who want to acquire more information on specific travel diseases such as their transmission, epidemiology, and prevention, the CDC has published Health Information for International Travel (which is commonly referred to as 'The Yellow Book') to serve as a reference for healthcare professionals providing travel health assessment to patients.

Table 1. Common travel health information resources

Information Resource	Description
Travel Health Service, Department of Health	➢ Information of common travel-related illnesses ➢ Availability of vaccinations in Hong Kong ➢ Information of travel health centres ➢ Current outbreak and travel alert
Traveler's Health, CDC	➢ Recommendations based on destination and special travel needs
Yellow Book, CDC	➢ Detailed information on travel health related information for healthcare providers

TRAVELLER'S DIARRHOEA

Traveller's diarrhoea (TD) associated with gastrointestinal infection is the most common illness reported in tourists travelling to countries with limited resources or lower income.[8] An analysis classified sub-Saharan Africa, South America, and South Asia as high-risk regions of travellers contracting the disease.[9] For clients travelling to these regions or those who have a high-risk of ingesting contaminated food, advice should be given on the prevention and management of TD. For the prevention of TD, the client should be instructed to be aware of food hygiene and try to avoid contaminated food and water. Raw or undercooked food should be avoided and tap water should not be consumed in areas where water treatment and sanitation are poor.[10]

Mild to moderate symptoms of TD can often be self-treated by tourists. Fluid and electrolytes replacement therapy remains to be the cornerstone in treatment of TD. For mild diarrhoea, fluid replacement therapy can be achieved by drinking plain water, fruit juice, or sports drinks. Pharmacists can also provide oral rehydration salts and instruct patients to dissolve it in an appropriate amount of clean drinking water for use as a replacement fluid. Besides fluid replenishment, antimotility agents such as loperamide or diphenoxylate-atropine can also be used for symptom control. Dosage and administration of these agents are summarised in **Table 2**. However, pharmacists should be aware that these antimotility agents are not recommended in severe diarrhoea with blood or fever; nor should these be recommended for children as they might cause severe side effects including opiate-induced ileus and abdominal distension.[11] Diosmectite, an adsorbent, is found to be effective in reducing recovery time of acute diarrhoea and had few side effects;[12] however its use in management of TD has not been well established.

If travellers experience severe symptoms such as high fever, bloody diarrhoea, vomiting, or persistent symptoms, they should seek medical consultation as antibiotic therapy might be necessary.

Table 2. Antimotility agents used in the treatment of traveller's diarrhoea

Ingredients	Usual Dose
Loperamide (Imodium)	4 mg initially, then 2 mg after each diarrhoea (Maximum 16 mg / day)
Diphenoxylate-atropine (Lomotil)	Diphenoxylate 5 mg QID until symptoms controlled (Maximum 20 mg diphenoxylate / day)

ALTITUDE SICKNESS

Due to decreased oxygen partial pressure in high altitude environment, tourists travelling to high altitude may suffer from hypoxia and hence develop high altitude illness (HAI).[13] HAI is divided into 3 main categories with different clinical presentations and severity: Acute Mountain Sickness (AMS), High-Altitude Cerebral Edema (HACE) and High-Altitude Pulmonary Edema (HAPE).

AMS is the milder form of HAI and most commonly presents with symptoms such as headache, nausea or vomiting, and insomnia. HACE and HAPE are severe forms of HAI and can cause death if not managed properly. Symptoms of HACE include mental function decline, confusion, and ataxia; while patients with HAPE may present with early symptoms such as shortness of breath and non-productive cough. Travellers going to altitude above 2500 m and with inadequate acclimatisation during ascent are at risk of developing HAI. Since HAI had caused death in mountain climbers [14] and HAI-related death could be prevented by proper early management, it is important to educate travellers about the disease.

Patients should be educated that human body could only respond and adjust to hypoxia with enough time (usually 3 – 5 days). Therefore, gradual ascent should be recommended to travellers to prevent development of AMS. The European Respiratory Review recommends avoiding rapid ascent of more than 300 – 600 m per night after reaching an attitude higher than 2500 m. Excess alcohol intake should be discouraged.[15] For patients with high risk of developing HAI or rapid ascent is required, medications can be used to prevent and treat AMS. Besides symptomatic relief of headache using paracetamol or non-steroidal anti-inflammatory drugs, acetazolamide is most commonly used for prevention and treatment of AMS by accelerating acclimatisation. The dose of acetazolamide for the prevention of AMS is 125 mg twice daily starting from the day before ascent and to continue until 2 – 3 days after staying in the same altitude or the start of descent. As acetazolamide is a diuretic, pharmacists should counsel patients on the potential side effect of frequent urination. It may also cause numbness in extremities and change in taste when consuming carbonated drinks. Pharmacists should also note that acetazolamide is a non-antibiotic sulphonamide. Although cross-sensitivity with antibiotic sulphonamides (such as co-trimoxazole) remains controversial and the risk is believed to be low,[16] it is best to carefully evaluate the appropriateness of use in patients with history of severe allergic reaction to sulphonamides. Dexamethasone is an alternative for patients who cannot tolerate acetazolamide, but prolonged use should be avoided due to possible long-term side effects of steroids. Both acetazolamide and dexamethasone are classified as prescription-only medications in Hong Kong, pharmacists can recommend correct use of these medications to physicians and counsel patients on their side effects.

Rhodiola crenulate extract (紅景天) is also popular among Hong Kong residents for prophylaxis of AMS. However, pharmacist should remind patients that the efficacy of *Rhodiola crenulate* is not substantiated by controlled trials. A small study (n = 102) even found that *Rhodiola crenulate* extract had no difference with placebo when used in preventing altitude sickness.[17] Dose and quality may also vary among different preparations of *Rhodiola crenulate* extract. Evidence-based recommendation thus cannot be made for this ingredient.

Proper recognition of symptoms is crucial in prevention of HAI-related deaths. If the traveller's symptoms worsen despite the use of medications or if symptoms related to HACE or HAPE develop, patient must initiate descent and seek medical attention as other therapies (e.g. oxygen therapy) may be required.

MALARIA

Malaria prophylaxis is another important topic often enquired by clients seeking travel health advice. Malaria is caused by parasites from the genus *Plasmodium* and is mainly transmitted by female *Anopheles* mosquito. In complicated disease, malaria can cause anaemia, renal and liver dysfunction, and even death if left untreated.

In a study investigating travellers in Hong Kong visiting areas with significant risk of malaria, only around 50% of subjects had employed mosquito bite prevention and less than 10% of subjects received chemoprophylaxis against malaria.[18] It showed that awareness among travellers towards malaria is insufficient and thus should be discussed during pre-travel consultation. Current endemic regions of the world include Africa, Latin America, South and Southeast Asia.[19] It is important to note that even within the same country, risk of malaria varies across different regions. For example, although Vietnam is classified as a malaria-endemic region, most of the popular tourist destinations, including the several major cities, reported no malaria transmission – only rural areas in the country are endemic.[20] Therefore, it is important for healthcare providers to enquire detailed itinerary of the travellers.

Prophylaxis against malaria are mainly divided into two groups: mosquito-bite prevention only or mosquito-bite prevention with chemoprophylaxis. For region-specific recommendations, travel health providers can refer to the CDC Malaria Prophylaxis by Country.[20] Pharmacists can provide counselling on both aspects of malaria prophylaxis. For travellers seeking mosquito repellents, pharmacists working in community setting

should provide unbiased information on different brands of insect repellents. The Centre for Health Protection in Hong Kong recommends using DEET-containing repellents for preventing mosquito bites[19] and the CDC recommends using products with ≥ 20 % DEET for optimal protection.[21] However, pharmacists should note that DEET-containing products cannot be used in children under 2 months of age and other suitable repellents or preventive measures should be employed. For children aged 2 months or above, repellents with DEET concentration up to 30 % can be used.[22] Pharmacists should instruct travellers on the correct use of repellents – apply to exposed skin and clothing and reapply repellents as required by the instruction of the label. Wearing appropriate clothing including long-sleeve shirts and pants that minimise exposed parts of body can also reduce risk of getting mosquito bites.

For patients requiring chemoprophylaxis against malaria, different regimens are available for pharmacists to recommend to physicians. Several factors should be taken into considerations when selecting specific regimen for prevention of malaria. The most important point to consider is the resistance to antimalarial medications in the destinations which information can be obtained from the CDC website. Other factors affecting the decision includes patients' medical condition, side effects and costs of mediations, and patient preferences. Commonly used chemoprophylactic agents against malaria available in Hong Kong and their limitations are summarised in **Table 3**.[23]

It is worth to note that pregnant women could suffer from more severe form of malaria compared to non-pregnant individuals and since all chemoprophylaxis regimens are not 100% effective, pregnant women should be advised to delay travelling to malaria endemic areas if possible.[23] If such travel is unavoidable, regimen containing medications not suitable for use in pregnancy should be avoided. Travellers should also be educated to seek medical attention if fever developed within 3 months after returning from malaria endemic regions.

YELLOWFEVER

Yellow fever is a mosquito-borne disease caused by virus of the family *Flaviviridae*, also known as yellow fever virus. It can cause haemorrhagic fever and lead to shock or organ failure. It is associated with high fatality rate up to 15 to 50 % for reported cases.[24] Currently, endemic countries are mostly in Africa and South America. Travellers who wish to travel to these areas must be advised on prophylaxis against yellow fever.

Since yellow fever is transmitted by mosquito, avoiding mosquito bites with appropriate clothing and repellents can reduce risk of acquiring the disease. However, the most important preventive measure for most travellers is getting yellow fever immunisation. It is also important to note that certificate of vaccination is an official requirement for entry into some countries. Currently, vaccination is recommended for travellers aged 9 months or older without contraindications.[25] For infants aged less than 9 months, postponing travel if possible is recommended.

In Hong Kong, only the two travel health centres operated by the Department of Health provide yellow fever immunisation and International Certificate of Vaccination or Prophylaxis. Travellers requiring vaccination should be reminded to make appointment in advance and receive consultation on time. They should note that the certificate will only be valid starting 10 days after the injection of vaccine.[26]

Table 3. Available malaria chemoprophylaxis regimen in Hong Kong

Medications and dose	Duration of treatment	Limitations
Atovaquone-proguanil 250 mg / 100 mg (Malarone) 1 tablet daily	Start 1 – 2 days before entering endemic area, continue until 7 days after return	➢ Expensive ➢ Not recommended for pregnant or breastfeeding women with infants less than 5 kg
Doxycycline 100 mg daily	Start 1 – 2 days before entering endemic area, continue until 4 weeks after return	➢ Not suitable for pregnant women and children under 8 years old ➢ Side effects: GI upset and photosensitivity ➢ Patient might not prefer to continue medications 28 days after return
Mefloquine (Mephaquin) 250 mg weekly	Start 2 weeks before entering endemic area, continue until 4 weeks after return	➢ Need to start 2 weeks prior to departure ➢ Need to continue treatment 4 weeks after return ➢ Resistance is observed in some regions ➢ Should not be used in patients with major psychiatric disorder or history of seizure

CONCLUSION

Travel health awareness is low and there are limited related service providers in Hong Kong. Pharmacists involved in primary care could possibly expand their role in providing pre-travel health advices to patients and fill the service gap. Pharmacists can provide advice on disease prevention, recommend required vaccinations, and suggest appropriate medication regimens to physicians. This article summarised reliable information sources and information of common travel-related diseases for practising pharmacists.

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Review of Food Ingredients Used in Over-The-Counter Skin Products for Paediatric Eczema

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ABSTRACT

Eczema is a common chronic skin condition in paediatric populations. It is treated using topical corticosteroids (TCS) and moisturisers. The objective of this study was to review the benefits and risks of food ingredients used in OTC skin products for paediatric eczema. 63 products were identified across 27 brands. In these products, nine food ingredients were documented in three or more brands. Shea butter, coconut oil and oatmeal may be beneficial to paediatric patients. There is limited evidence on avocado oil and conflicting evidence on olive oil. There is a lack of evidence for Aloe vera, goat milk, almond oil and cocoa butter. Also, skin allergic reactions are reported on coconut oil, oatmeal, Aloe vera and goat milk. Subsequent new-onset food allergies were reported in oatmeal and goat milk. A wide variety of products and food ingredients are available with purported benefits. Shea butter and coconut oil may bring anti-inflammatory benefits with relatively low risks of allergic reactions. Pharmacists can play a greater role in counselling patients on product selection and informing them of possible benefits and risks of using these products.

Keywords: eczema, atopic dermatitis (AD), food ingredients, paediatric, over-the-counter (OTC) products

INTRODUCTION

Eczema is one of the most common skin diseases and the prevalence of it is higher in the paediatric population, with a 4.6% prevalence in the Hong Kong children aged six to seven in 2006.[1] To relieve the itch and dry skin in these patients, topical corticosteroids (TCS) in acute flare-ups and the use of moisturisers/emollients for long-term management are the mainstays of treatment.[2] However, adherence to TCS has always been a concern. A questionnaire for caregivers of children with eczema conducted in Japan[3] found that 38.3% of caregivers would not use TCS on their child's skin. Compared to those willing to use TCS, the caregivers that were unwilling were 18.2% ($p < 0.001$) more likely to perceive adverse effects of TCS on the skin and were 13.9% ($p = 0.001$) more likely to perceive systemic adverse effects of TCS. Also, they were 9.2% ($p = 0.013$) more likely to seek alternative care.

One alternative option that these parents may consider is the purchase of over-the-counter (OTC) skincare products. Regarding factors to be considered when purchasing such products, a survey conducted in 2014 found that slightly more than half of the parents surveyed were concerned about the safety of ingredients (51%) and would choose natural ingredients (53%) when purchasing topical products for their babies.[4] However, products with natural ingredients may or may not be safe for topical application as products with natural ingredients may contain more sensitizers compared to synthetic products with simpler formulations.[4] Nevertheless, analysis of consumer behaviour suggests marketing natural and organic products with a focus on safety may be an effective approach to encourage purchasing behaviour.[5] This may explain the popular association that natural and organic ingredients are safe for the body.

According to the Food and Drug Administration (FDA) of the United States, "food" refers to "a raw, cooked, or processed edible substance, ice, beverage, or ingredient used or intended for use or for sale in whole or in part for human consumption, or chewing gum".[6] Recently, there

is a trend of incorporating common food ingredients into the products with a similar appeal that they are natural and thus safe, but there is currently limited literature evaluating the size of this market. Because of this and the aforementioned safety concerns for these products, there is a need to understand the currently available food-containing skincare products in the market. The objective of this study was to review the benefits and risks of food ingredients used in OTC skin products in Hong Kong. This article will discuss the possible effects, evidence on the effectiveness and associated risks for the food ingredients contained in them.

METHODOLOGY

A territory-wide survey was conducted during a two-week period in July 2019 by the investigators to create a list of OTC skin products with food (either in pictures or words) on the front packaging available in the market in ten chain community pharmacies (Watsons or Mannings) stores with pharmacist service. All topical products such as creams, gels, lotions and ointments would be included. We excluded products used for cleansing purposes (e.g. shampoos and body wash), cosmetic products, sunscreens, sunburn relief products and lip balms. All food ingredients present in the products would be identified.

From the survey results, ingredients that are documented in products from three or more brands would be researched. Evidence related to these ingredients for eczema (atopic dermatitis) and pruritus were searched in the tertiary database Natural Medicines. A literature search was also conducted in July 2019 in PubMed, Embase and Cochrane Library search engines for related articles in the period 1999-2019. For the terms used in the search, one term was selected from each of the two lists: (1) "aloe vera", "shea butter", "olive", "cocoa butter", "almond oil", "avocado oil", "oatmeal", "coconut oil", "goat milk", "milk"; (2) "eczema", "dermatitis", "atopic dermatitis", "skin", "topical", connected by the logical operator "AND". This resulted in a total of 50 combinations. The search would identify articles in English only.

RESULTS

A total of 63 relevant products were found across 27 brands among ten chain community pharmacies. These products are listed in **Table 1**.

(1) Aloe Vera

Aloe vera, also known as *Aloe barbadensis*, is rich in vitamins like vitamin A, B_9, B_{12}, C and E, as well as anti-inflammatory substances like polyunsaturated fatty acids, cholesterol, β-sitosterol, carboxypeptidase and bradykinase, which may help to relieve some allergic and inflammatory conditions.[7] The inner, clear, mucilaginous pulp of the leaf is the most commonly used part of *Aloe vera* as an emollient.[7] However, in the literature search, no evidence supporting the topical use of *Aloe vera* in paediatric eczema was found.

A study demonstrated that no patch test reaction to concentrated *Aloe vera* gel was observed in 702 patients.[8] Nevertheless, a 72-year-old woman who had applied home-made *Aloe vera* juice over her legs for pain relief developed dermatitis on the legs followed by erythema on the eyelids.[9]

Without any evidence of the effectiveness of topically applied *Aloe vera* in paediatric eczema and with a case report of allergic reactions, such use is not recommended.

(2) Shea Butter

Obtained from fruits of the shea tree *(Vitellaria paradoxa)* commonly found in Africa, shea butter is an ivory-coloured natural fat containing a considerable amount of fatty acids, in which 85-90% of them are stearic acid and oleic acid. It has been shown that shea butter possesses anti-inflammatory effects by reducing levels of lipopolysaccharide (LPS)-induced proinflammatory cytokines and interleukins, as well as suppressing NF-κB activation.[10]

In a study conducted in Hong Kong, the mean pruritus score of paediatric patients was found to significantly decrease from 6.7 to 6.0 (p = 0.036) after the use of Ezerra™ cream, which contains shea butter. Compared to the data of a ceramide product, no statistically significant differences in efficacy and patient acceptability were found.[11] Based on the literature search, the topical application of shea butter may be beneficial for paediatric patients with eczema.

(3) Olive

Different parts of olive, such as oil, fruit, husk and extract, were found in the skin products during the survey. Among them, olive oil was the most common one, with some products being pure olive oil. Olive oil was also the focus of the studies found in the literature search.

The main constituent of olive oil is oleic acid, with other fatty acids like linoleic acid and palmitic acid as the minor constituents.[12] With an optimum quantity of oleic acid acting as a skin softener, a substantial amount of squalene, as well as the presence of β-sitosterol, olive

Table 1. Over-the-counter skin products containing food ingredients available in Hong Kong chain community pharmacies

Food ingredient*	No. of brands with products containing the ingredient	Other names	Example of products
Aloe vera	11	*Aloe* (vera) *barbadensis* (leaf/ juice/ gel powder/ miller extract) / アロエエキス-2	BOTANECO GARDEN organic argan & virgin olive oil hand & body lotion DEWYTREE green power aloe soothing gel FLEURANCE NATURE 96% aloe vera gel FLEURANCE NATURE nourishing body milk with aloe vera GOAT kids goat organic lotion HOLLAND & BARRETT aloe vera gel JAMIESON aloe vera soothing moisturizing gel NATURE REPUBLIC aloe vera 92% soothing gel NATURE'S SUPERPLANT aloe vera jelly PALMER'S baby butter baby lotion with cocoa butter & aloe PIGEON baby aloe vera body lotion (ピジョン 薬用ローション アロエ) VASELINE intensive care aloe soothe lotion
Shea butter	11	*Butyrospermum parkii* (shea) (butter/ nut/ extract)	AVEENO baby soothing relief moisture cream AVEENO skin relief hand cream AVEENO skin relief moisturizing cream BOTANECO GARDEN organic argan & virgin olive oil hand & body lotion CAPRINA moisturizing body milk - with shea butter CETAPHIL baby daily lotion with shea butter FLEURANCE NATURE nourishing body milk with aloe vera GOAT kids goat organic lotion NATURALS BY WATSONS macadamia body lotion / hand cream NATURALS BY WATSONS marula body lotion / hand cream NATURALS BY WATSONS olive body lotion / hand cream NATURALS BY WATSONS paw paw body lotion / hand cream PALMER'S raw shea body lotion ST. IVES soothing oatmeal & shea butter body lotion TROPICANA coconut body butter / hand cream WATSONS silk moisturising facial cream
Olive	7	*Olea europea* (fruit/ husk/ oil/ extract)	AVADO baby naturals winter cream BOTANECO GARDEN organic argan & virgin olive oil hand & body lotion CUSSONS lotion soft & smooth (almond & rose oil) DR. JACOB'S APOTHECARY pure olive oil bp MANNINGS pure olive oil NATURALS BY WATSONS olive body lotion / hand cream NATURALS BY WATSONS paw paw ointment WATSONS olive oil
Almond oil	5	*Prunus amygdala dulcis* oil	BOTANECO GARDEN organic trio oil body lotion (sweet almond & argan) CUSSONS lotion soft & smooth (almond & rose oil) GOAT kids goat organic lotion ST. IVES 24 hour restoring almond & flaxseed oil body lotion ST. IVES 24 hour restoring almond & linseed body lotion TROPICANA coconut body butter
Avocado oil	5	*Persea gratissima* oil	AVADO baby naturals moisturiser / winter cream BOTANECO GARDEN organic trio oil body lotion (sweet almond & argan) GOAT kids goat organic lotion NATURALS argan body lotion / hand cream ST. IVES hydrating vitamin E & avocado body lotion
Cocoa butter	5	*Theobroma cacao* seed butter	AVEENO skin relief moisturizing cream GOAT kids goat organic lotion PALMER'S baby butter baby lotion with cocoa butter & aloe PALMER'S baby oil with pure cocoa butter & natural oils PETITE PLANET multipurpose barrier balm TROPICANA coconut body butter
Coconut oil	4	*Cocos nucifera* oil	GOAT kids goat organic lotion NATURALS macadamia body lotion / hand cream OVELLE coconut oil emollient moisturiser TROPICANA coconut body butter / hand cream
Oatmeal	4	*Avena sativa* kernel (flour/ oil/ extract) / colloidal oatmeal	AVEENO baby calming comfort lotion / daily moisture lotion AVEENO baby dermexa moisturizing cream AVEENO baby soothing relief moisture cream AVEENO daily moisturizing lotion (sheer hydration / stress relief) AVEENO dermexa moisturizing cream AVEENO skin relief hand cream / moisturizing cream / moisturizing lotion DERMAVEEN moisturizing lotion PALMER'S raw shea body lotion ST. IVES soothing oatmeal & shea butter body lotion
Goat milk / milk	3	*Caprae lac* / hydrolysed milk protein	CAPRINA moisturizing body milk - original formula CAPRINA moisturizing body milk - with shea butter GOAT kids goat organic lotion SCENTIO whitening body lotion

* Only ingredients that are found in three or more brands are included in this table

oil has a similar composition as sebum, thus enabling olive oil to protect the skin.[13] Hydrophilic phenols are also present in olive oil as the most abundant antioxidants.[12]

In a pilot, assessor-blinded, randomised clinical trial (RCT) named OBSeRvE, the level of hydration in the olive oil group was significantly higher than the group without any topical application of oil in arm, abdomen and thigh ($p < 0.05$), but no significant difference was found in transepidermal water loss (TEWL), erythema and skin pH in the two groups. However, the clinical significance of olive oil has not been clearly demonstrated yet.[14]

An RCT studying olive oil/lanolin cream showed that the group of olive oil/lanolin cream had a significantly higher skin condition grading, which considered skin dryness, presence of erythema and skin breakdown, when compared with the group of Bepanthen®, which is a water-in-oil emollient cream, on days 14 ($p = 0.041$), 21 ($p = 0.002$) and 28 ($p = 0.022$), suggesting that the olive oil/lanolin cream demonstrated superior performance. However, such a comparison may not truly reflect the effectiveness of olive oil.[15]

Findings from another study discouraged the use of olive oil in eczema. Adult participants tested with olive oil resulted in a significant reduction in the thickness and integrity of stratum corneum, and since the skin of infants is known to be more vulnerable than that of adults, the study predicted that olive oil would also pose such harmful effect on infant skin, and even worsen the situation of eczema due to the damage of skin barrier function.[16]

Based on the above studies, with the evidence of skin barrier damage by olive oil and insufficient evidence on the efficacy of olive oil in eczema, the topical use of olive oil in paediatric patients with eczema is not encouraged.

(4) Almond Oil

Almond oil is obtained from *Oleum amygdalae* and may have the properties of an emollient.[12] However, there is a lack of studies on the efficacy of almond oil for eczema.

(5) Avocado Oil

Extracted from the fruit of *Persea americana*, avocado oil is rich in fatty acids like oleic acid (31.8–69.6%), linoleic acid (6.1–22.9%) and linolenic acid (0.4–4.0%), with some other components like β-sitosterol, β-carotene and lecithin as well.[12]

Topically applied avocado oil applied possibly acts by forming a protective layer on the skin surface, as the penetration of the oil into deeper layers of stratum corneum could not be detected in a study.[17] The study also demonstrated that TEWL after 30 minutes of topical treatment with avocado oil decreased by 15% from 11.70 g/hm^2 to 9.93 g/hm^2 ($p < 0.05$), implying that avocado oil may help to reduce water loss from the skin.

However, given that the study only included six adult participants, its results may not apply to paediatric eczema patients.

(6) Cocoa Butter

Cocoa butter is a tropical plant oil with 59.5% saturated fatty acids, 35.1% monounsaturated fatty acids and 3.4% polyunsaturated fatty acids.[18] There is a lack of studies on the efficacy of cocoa butter for eczema.

(7) Coconut Oil

Extracted from the kernel or flesh of mature coconuts of the coconut palm *(Cocos nucifera)*, coconut oil is a common food ingredient used in skincare products. A substantial number of free fatty acids (FFAs) are present in coconut, including lauric acid (49%), myristic acid (18%), palmitic acid (8%), caprylic acid (8%), capric acid (7%), oleic acid (6%), linoleic acid (2%), and stearic acid (2%).[12] Among the free fatty acid components of coconut oil, monolaurin, which is a monoglyceride derived from lauric acid, has been shown to provide antimicrobial effects by altering the bacterial cell envelope.[19]

Despite the lack of industry-standard definition, virgin coconut oil (VCO) is considered as the purest form of coconut oil, which is colourless and free from rancidity.[20] A study found that topical application of VCO produces anti-inflammatory activity by the inhibition of various cytokines, such as TNF-α, IFNγ, IL-5, IL-6 and IL-8. The study also revealed that applying VCO topically improves skin barrier function by the up-regulation of aquaporin-3 (AQP-3), filaggrin and involucrin mRNA expression, as well as by the protection against UVB irradiation.[21]

Potential clinical benefits of coconut oil in children with eczema have been studied. A double-blind randomised clinical trial targeting children aged one to 13 years showed that applying VCO topically for eight weeks was superior to mineral oil in clinical and instrumental assessments. The mean SCORing of Atopic Dermatitis (SCORAD) index values of the VCO group was reduced by 68%, which was significantly greater ($p < 0.001$) compared to the decrease by 38% in the mineral oil group. VCO achieved a 73% decrease in post-treatment mean TEWL compared to 44% in the mineral oil control, while the increase in post-treatment skin capacitance was 32% in the VCO group compared to 20% in the mineral oil control. The difference starts to become apparent after four weeks of treatment.[22]

Some studies focusing on the topical use of coconut oil on preterm infants have been conducted as well. In a randomised controlled trial, the Neonatal Skin Condition Score (NSCS) was significantly higher ($p < 0.01$) in the group of pre-term babies receiving topical VCO than the group without any topical application on day 7, 14, 21 and 28. The preterm infants in the VCO group were 0.31 times less likely to suffer from decreased skin maturity.[23] Another randomised controlled trial has also demonstrated that applying coconut oil topically in very preterm infants starting within 24 hours from birth is safe, effective and feasible in maintaining skin integrity.[24] However, despite the potential benefits brought by topical application of coconut oil to the skin of preterm infants, according to a systematic review, the quality of evidence is low to moderate.[25]

As coconut is a fruit but not a nut, allergy to coconuts is rare. All reported cases are rare anaphylactic reactions. One case report of an anaphylactic reaction was found which presented a boy aged six years who experienced generalised urticaria to topically applied coconut oil in spite of previous exposure to it without any adverse effects. Widespread hives occurred two weeks later, and afterwards, allergy to coconuts via gastrointestinal tract arose, which was treated successfully with antihistamines.[26]

In summary, coconut oil has been found to bring potential benefits for paediatric patients with atopic dermatitis, and the risk is relatively low.

(8) Oatmeal

Colloidal oatmeal contains 0.03% of avenanthramides,[27] which are thought to be the principal therapeutic components in topical oatmeal products. Oatmeal products are possibly effective in relieving itchiness in patients with eczema as avenanthramides reduce histamine release from mast cells. They also have direct antioxidative functions and anti-inflammatory functions by suppressing relevant mediators such as PLA2, IL-8 and NF-κB.[27,28] Concerning the oatmeal ingredient as a whole, it can reduce skin pH hence reducing irritation to the skin. It also contains proteins and polysaccharides which act as natural emollients to create a barrier against water loss.[29]

Evidence supporting the use of oatmeal cream have been conflicting. A 2017 Cochrane systematic review with three studies concluded no statistically significant difference in eczema disease severity and quality of life scores after using oatmeal cream when compared with a control.[30] However, it did not include a recent double-blind randomized control trial comparing 1% oatmeal cream to a prescription barrier cream EpiCeram®.[31] In 90 paediatric patients with mild to moderate eczema, there are no statistically significant differences in Eczema Area and Severity Index (EASI) score and Visual Analogue Scale (VAS) itch score between the two study arms. 6 patients in the oatmeal arm (13%) reported adverse events such as pruritus and rash, compared to 2 patients (4%) in the EpiCeram® arm. Nevertheless, there has yet to be an RCT with an oatmeal cream and an acute treatment cream to compare their anti-pruritic or anti-inflammatory effects. The current evidence for this involves an uncontrolled study based on patient self-reporting that shows improvement in pruritus over a 14-day treatment period.[28]

Although the use of colloidal oatmeal is generally safe, there are case reports of allergic reactions to oatmeal topical products. Such reports are generally immediate IgE-mediated Type I reactions or delayed T cell-mediated Type IV anaphylaxis.[32] Patients usually present with an immediate pruritic rash (Type I) or symptoms like eczema flare-ups (Type IV) which resolve with cessation of product use. However, in a rare serious case, a 30-year-old patient with eczema who once applied oatmeal cream to areas with exposed broken skin a few years back developed a new-onset oatmeal food allergy. She was admitted to the ER in an anaphylactic episode after consuming oat-containing apple crumble. It is suggested that applying oatmeal products to broken skin causes IgE-mediated sensitization, which contributes to serious anaphylaxis in the future.[33]

As to whether the incidence of oat allergy and sensitization is prevalent, we look at a study with paediatric eczema patients. Among 50 paediatric users of oatmeal cream, 16% developed skin reactions with the majority being eczema flare-ups. On the other hand, 35% of 40 users were tested oat-IgE positive.[34] This brings an increased risk of anaphylaxis upon ingesting or applying oatmeal products in the future. Therefore, the use of oatmeal products is associated with some effectiveness but a considerable risk of allergic reactions.

(9) Goat Milk / Milk

From our literature search, we cannot find any articles suggesting the mechanism of action or efficacy of topical application of goat milk or milk in treating eczema.

A case report published in 2014 stated that a 55-year-old woman developed IgE-mediated anaphylaxis after ingesting salad with goat cheese, and she had been using a goat milk-containing skin moisturiser frequently four months before.[35] Another case report also mentioned a woman who had been using goat milk soap to treat mild eczema since 2009 suffered from itchy mouth while consuming goat cheese. She also contacted urticaria after applying a moisturiser with goat milk.[36] With the risk of anaphylaxis and the lack of evidence supporting the use of milk, it is not recommended to use milk-containing skin products.

Table 2. Summary of evidence regarding the use of food ingredients in over-the-counter skin products

Food	Evidence from Interventional Studies on Effectiveness					Allergies reported
	Study	Patient Population	N	Duration	Results	
Aloe vera	---					Yes[9]
Shea butter	Hon et al. (2015)[11]	Paediatric patients with AD	34	4 weeks	<u>After using Ezerra cream:</u> a) Pruritus score: significantly decreased from 6.7 to 6.0 (p = 0.036) <u>Ezerra cream vs Ceramide cream:</u> b) SCORAD & GAT: no significant difference	None reported
Olive	Cooke et al. (2016)[14]	Full-term babies (gestation ≥37 weeks), in good health and < 48 or 72 hours old*	115	4 weeks	<u>Olive oil vs No topical application:</u> a) Level of hydration: olive oil significantly higher in arm (p = 0.021), abdomen (p = 0.011) and thigh (p = 0.014) b) TEWL, erythema, skin pH: no significant difference	None reported
	Kiechl-Kohlendorfer et al. (2008)[15]	Preterm infants between 25 and 36 weeks of gestation	173	4 weeks	<u>Olive oil/lanolin cream vs Bepanthen:</u> Skin condition grading: Day 7: 1.09 vs 1.33 (p = 0.292) Day 14: 1.28 vs 2.11 (p = 0.041) Day 21: 1.40 vs 3.00 (p = 0.002) Day 28: 1.40 vs 2.70 (p = 0.022)	
	Danby et al. (2013)[16]	Volunteers aged ≥ 18 years – previous history of AD in all of cohort 1 and half of cohort 2	7 (cohort 1) 12 (cohort 2)	5 weeks	<u>Olive oil vs No topical application:</u> a) Thickness of SC: significant reduction (p < 0.05) b) TEWL (integrity of SC): p = 0.001 in volunteers with history of eczema; p = 0.005 in volunteers without history of AD	
Almond oil	---					None reported
Avocado oil	Patzelt et al. (2012)[17]	Healthy volunteers aged 25-50 years	6	30 minutes	<u>After 30 minutes of topical treatment of avocado oil:</u> TEWL: decreased by 15% (p < 0.05)	None reported
Cocoa butter	---					None reported
Coconut oil	Evangelista et al. (2014)[22]	Children aged 1-13 years	117	8 weeks	<u>VCO vs Mineral oil:</u> a) Reduction in SCORAD: 68% vs 38% (p < 0.001) b) Decrease in TEWL: 73% vs 44% (p < 0.001) c) Increase in skin capacitance: 32% vs 20% (p = 0.0309)	Yes[26]
	Konar et al. (2019)[23]	Preterm newborns (< 37 weeks)	2294	4 weeks	<u>VCO vs No topical application:</u> a) NSCS: Day 7: 4.3 vs 5.1 (p < 0.01) Day 14: 4.4 vs 5.4 (p < 0.01) Day 21: 4.2 vs 5.5 (p < 0.01) Day 28: 3.9 vs 4.8 (p < 0.01) b) VCO group 0.31 times (95% CI: 0.24-0.39) less likely to suffer from decreased skin maturity	
	Strunk et al. (2018)[24]	Very preterm infants (gestation < 30 weeks, postnatal age < 24 hours)	72	3 weeks	<u>Coconut oil vs No topical emollient:</u> a) Safety: no adverse events due to topical use of coconut oil b) NSCS: stable vs increased (p = 0.01) c) Feasibility: all infants in coconut oil group completed 100% of scheduled applications	
Oatmeal	Lisante et al. (2017)[31]	Patients aged 6 months to 18 years with mild to moderate AD	90	3 weeks	<u>1% oatmeal cream vs EpiCeram:</u> a) EASI & VAS itch scores: no significant difference b) Reported adverse events: 6 patients (13%) vs 2 patients (4%)	Yes[33,34,35]
	Reynertson et al. (2015)[32]	Healthy female subjects aged 18-60 years	29	2 weeks	<u>Uncontrolled study:</u> Reduction in itch intensity: significant over 14 days of treatment (p < 0.05)	
Goat milk / milk	---					Yes[36,37]

* Less than 48 hours old if recruited between September 2013 and February 2014 inclusive or less than 72 hours old if recruited between March 2014 and June 2014 inclusive

<: less than; ≥: more than or equal to; AD: Atopic dermatitis; CI: Confidence interval; EASI: Eczema Area and Severity Index; GAT: Global Acceptability of Treatment; NSCS: Neonatal Skin Condition Score; SC: Stratum corneum; SCORAD: SCORing of Atopic Dermatitis; TEWL: Transepidermal water loss; VAS: Visual Analogue Scale; VCO: Virgin coconut oil

DISCUSSION

Analysis of Results

Table 3 ranks the nine food ingredients according to the evidence of efficacy and risk found in this review. From our review, shea butter may be beneficial for paediatric eczema patients. Coconut oil also poses a low risk with potential benefits. Given the very small number of adult subjects in only one study, the benefits of avocado oil in paediatric eczema patients may not be the same. Paediatric eczema patients are not encouraged to use olive oil topically because of the evidence of skin barrier damage and inadequate evidence on its efficacy. Though there is some evidence supporting the effectiveness of oatmeal, the risk of allergic reactions of oatmeal is relatively high. With a lack of evidence of the effectiveness and an allergy case report, the topical use of *Aloe vera* is not recommended. Goat milk should be avoided due to the lack of evidence for efficacy as well as the risk of anaphylaxis. There is still a lack of studies regarding the topical use of almond oil and cocoa butter.

Table 3. Summary of evidence of efficacy and risk of food ingredients

Description	Food Ingredients
With evidence of efficacy & low risk	Shea butter, coconut oil
With insufficient evidence of efficacy	Avocado oil
With insufficient evidence of efficacy & with evidence of risk	Olive oil, oatmeal
Without evidence of efficacy	Almond oil, cocoa butter
Without evidence of efficacy & with evidence of risk	*Aloe vera*, goat milk

Home Remedy: Egg Yolk Tar

In an episode of Scoop (TVB Jade) on 20 May 2019, the use of "egg yolk oil" being effective for eczema patients was shown.[37] From a Western medicine perspective, the egg yolk itself has yet to be studied in eczema patients. However, it is suggested that the dark-coloured tar resulting from frying egg yolks may have therapeutic effects instead.

Tar has been used for the treatment of eczema for centuries, with the most notable examples being coal tar and pine tar. Coal tar (as well as other types of tar) is believed to have anti-inflammatory and anti-pruritic effects. Tar-mediated activation of aryl hydrocarbon receptors (AHR) leads down a signalling pathway that results in antioxidative effects and accelerated epidermal differentiation. It can also restore filaggrin protein expression. Hence, a combination of these effects may lead to improvement of skin condition.[38]

Despite these benefits, home production of egg yolk tar is not recommended due to potential carcinogenic risk that might arise from the unregulated production process. It is reported that the production of this remedy produces benzopyrenes, a known carcinogen.[39] Therefore, the use of other commercially available tar lotions or gels is recommended instead.

Role of Community Pharmacists

Community pharmacists may encounter enquiries on unfamiliar OTC products or even home remedies for eczema treatment on a day-to-day basis. Given a wide variety of products available, pharmacists play a vital role in recommending appropriate moisturisers for eczema patients.[40] While searching on Natural Medicines database can provide information on some ingredients, often information is limited. When dealing with food-ingredient containing OTC skin products in general, the misconception that food products must be safe for the skin should be corrected. Also, when applying food products, which contain protein antigens, onto the skin, there is a risk of allergic reactions. Avoiding application to broken skin may reduce the risk of sensitization. For patients with extensive and severe eczema, avoidance of such products is recommended. In addition, patients with a known food allergy are advised not to apply that food product topically.

On the other hand, rather than only providing information on the product, it may also be useful for the pharmacist to investigate the underlying reason for customers to search for these products. It should be emphasized to customers that the products included in this article are mainly for moisturizing purposes and cannot replace the use of TCS in acute flare-ups. As mentioned, customers with more negative perceptions about TCS may be more likely to seek alternative treatment options. As such, pharmacists are in the optimal position to destigmatize certain treatment options such as steroid phobia associated with the use of TCS and to resolve misconceptions about eczema.[41]

Limitations

To the best of our knowledge, this study is the first of its kind to survey food ingredients available in topical OTC products. We acknowledge that some products will be excluded by the exclusion criteria we have set for this study. We tried to exclude irrelevant products (e.g. fruit-scented body washes) to avoid including too many products irrelevant to an eczema patient but this is done in the expense of excluding some relevant products (e.g. body wash claimed for eczematous skin). Nevertheless, irrelevant products excluded were in the majority while relevant products excluded were in the minority. Also, we noted that the brands that produce relevant products but were excluded also produce products that were within

the inclusion criteria (e.g. lotions and creams). On the other hand, the product search was conducted in Hong Kong and therefore its results may not apply to other locations. However, the evidence researched for the food ingredients is not geographically bound.

When conducting the literature search, the investigators noted that results were quite limited. However, such products were found in multiple stores across Hong Kong. This shows a lack of literature and a need for further research on the topic for healthcare professionals to make informed judgements about the use of such products. It should be noted that the evidence obtained from the search is for the food ingredient but not a specific product. Often, a successful moisturiser is a combination of multiple ingredients in the formulation, with emollient, humectant and occlusive functions.[41] Therefore, the pharmacist should exercise his/her professional judgement and assess the entire formulation comprehensively to determine whether to recommend a specific product.

CONCLUSION

The use of food ingredients in skin products is quite common based on our survey in chain community pharmacies in Hong Kong. Based on the findings in this review, the use of shea butter and coconut oil may be beneficial for paediatric patients with eczema. Without the evidence of efficacy and with possible risk, *Aloe vera* and goat milk should be avoided. There is conflicting or no evidence for other food ingredients in the search.

It is crucial for pharmacists to understand that using a sole ingredient (e.g. pure olive oil) in skin products, is often not the best moisturiser option for patients. Besides the food ingredients, pharmacists should also be aware that many of the OTC skin products may also contain other substances (e.g. fragrances, preservatives) which may be harmful or irritating to patients. With the complexity of ingredients among OTC skin products, community pharmacists play a vital role in assisting patients in product selection and resolving misconceptions about the skin condition and treatment options.

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SHPHK - Learning never stops!

Happy mid-autumn festival!

The Food and Health Bureau (FHB) has been working tirelessly on the promotion of primary health care development, health management and patient empowerment to the public in Hong Kong.

The Society of Hospital Pharmacists of Hong Kong (SHPHK) shares the same vision as FHB and always supports and advocates the partnership between the public and private/NGO healthcare sectors. On 24th August 2019, Hon. Assoc. Prof. William Chui, President of SHPHK was invited to attend the 'Primary Health Care Development in Sham Shui Po - Forum to Promote Clinical, Social and Public Cooperation' organised by The Hong Kong Society for Rehabilitation, and to give an introduction on the pharmaceutical services available in primary and secondary care sectors to the forum participants. In the Forum, Hon. Assoc. Prof. Chui once again emphasized that it is important for hospital pharmacists and NGO pharmacists to supplement each other in order to provide people-centred and quality pharmaceutical care to the public and patients.

'Primary Health Care Development in Sham Shui Po - Forum to Promote Clinical, Social and Public Cooperation' on 24th August 2019. From left: Prof. Albert Lee, Professor (Clinical), The Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong; Hon. Assoc. Prof. William Chui, President, SHPHK; Dr. Foo Kam So Stephen, Specialist in Family Medicine; Mr. Yuen Siu Lam, Chairman, Hong Kong Alliance of Patients' Organisation Limited and the Self Help Group for the Brain Damaged; and Mr. Chow Yick-hay, BBS, JP, Chairman, Kwai Tsing Safe Community and Healthy City Association.

The General Committee Members of the Society will continue to actively participate in different healthcare forums in the future.

SHPHK Professional Seminars (July to September)

Between July and September, the Society has organized a series of professional seminars to help its members to keep abreast of the new treatment guidelines on different clinical topics and enhance continuing education for hospital pharmacists.

On 22nd August 2019, a seminar on Hepatitis B was successfully held at Eaton Hotel Hong Kong. This was the second seminar of the Antiviral ABC course series. We were honored to have **Dr. Fung James Yan Yue**, Consultant and Honorary Clinical Associate Professor, Department of Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, and **Mr. Jason Chen**, Pharmacist of Ruttonjee & Tang Siu Kin Hospitals to share with us the latest treatment options for Hepatitis B. The final seminar of the series, Hepatitis C seminar will be held on 24th October 2019. Do not miss it if you are interested in knowing more about the latest development in Hepatitis C treatment and patient care.

Hepatitis B seminar on 22nd August 2019. From left: Mr. Jason Chen, Pharmacist, Ruttonjee & Tang Siu Kin Hospitals; Mr. Johnny Wong, Vice-president, SHPHK; Dr. Fung James Yan Yue, Consultant and Honorary Clinical Associate Professor, Department of Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong.

Another highlight of the year is the Dinner Conference on Pharmacy Automation held on 25th September 2019. In the conference, Dr. Christopher R. Fortier, distinguished speaker of the Conference as well as the Chief Pharmacy Office of Massachusetts General Hospital in Boston will share his invaluable experience in implementing pharmacy automation in his workplace with the audience.

Shanghai-Hong Kong Hospital Pharmacy Management Summit Forum

Good news! The Society will be organising a Summit Forum with Shanghai Pharmaceutical Association on hospital pharmacy management on 15th-16th November 2019. The forum will be held in Shenzhen. This is a great opportunity for Hong Kong hospital pharmacists to exchange views and clinical experience with pharmacists from Macao and the Mainland.

The tentative meeting Agenda is as follows:

11月15日

代表報到（深圳華潤大學）木棉花酒店

18：00-20：00 專家見面會

11月16日

8:30-9:00	開幕式	上海市藥學會領導 香港醫院藥劑師學會 華潤集團領導
9:00-9:30	智慧藥事服務和共用平台	上海市藥學會負責
9:30-10:00	香港臨床試驗的概況	香港醫院藥劑師學會負責
10:00-10:15	茶歇	
10:15-10:45	報告3	澳門藥學會負責
10:45-11:15	香港基層藥劑服務的發展	香港醫院藥劑師學會負責
11:15-11:45	報告5	華潤集團負責
11:45-12:15	報告6	廣東省藥學會負責
12:30-13:30	午餐	
13:30-14:15	香港腫瘤科藥劑師	香港醫院藥劑師學會負責
14:15-15:00	培訓課程2	澳門藥學會負責
15:00-17:00	滬港專家座談交流會	

Places are very limited! The registration for the Summit Forum will open soon! Please stay tuned!

More events to come!

If you are a pharmacy student, then you must join the SHPHK student workshop on personal branding and effective communication led by Mr. Gary Lo, Managing Director & Principal Instructor, Glo Consulting on 11th October 2019 at The Cityview, Yau Ma Tei. By the end of the workshop, students will learn the best practices for building a world class brand, and how these concepts can apply to strengthening their presence and credibility within the organisation.

On 7th December 2019, the Society will organise a seminar on Paediatric Total Parenteral Nutrition at the auditorium of Hong Kong Children Hospital (HKCH). Interested hospital pharmacists may also join the tour to HKCH Pharmacy Department after the seminar (Places are limited). Details of the event will be announced through the SHPHK News Reporter in due course.

You are most welcome to follow the Society's Facebook page (@SHPHK) to know more about the Society's development and activities. You may also visit the Drug Education Resources Centre (DERC) Website: www.derc.org.hk to keep abreast of the latest news and development of pharmaceutical services in Hong Kong. Join us now as new member or renew your membership at the Society's website: www.shphk.org.hk.